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ILLUSTRATIONS

OF

SOUTH AMERICAN PLANTS.

BY

JOHN MIERS, F.R.S. F.L.S., &c.

VOL. I.

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PREFACE.

THESE contributions to the Botany of South America are the results of observations made by the Author, during several years residence, both on the Western and Eastern shores of that vast continent. Having availed himself of the opportunity of examining many plants in the living state, and also preserved drawings and details of a great number, he proposes to select from these, such as may be still undescribed, or yet imperfectly understood. In the course of these investigations, he has met with many ambiguities in several already recorded species, and after a careful examination of dried specimens, whenever they have been within his reach, he has sought to ascertain how far they severally correspond with the most authorized generic characters, and how far it becomes necessary to remodel these characters, in accordance with more recent, and more extended observations: in this way, he hopes to have collected a few satisfactory materials towards monographs of several genera; these will not be offered in any regular order, but as the subjects present themselves to his notice. In his endeavours to carry out this plan, he has received much kind assistance from Sir W. Hooker, and he has great pleasure in acknowledging his obligation to that distinguished Botanist, for the liberality with which he has afforded the use of his valuable library of reference, and the

freest access to his extensive herbarium, which is particularly rich in the botanical productions of South America. From this fertile source, and the different herbaria in the British Museum, as well from the materials in his own collection, he has prepared the following contributions, accompanied by illustrations and the details, which according to his views, tend to exemplify the characters of each genus referred to. The vast accumulation of plants during the last few years, collected in all parts of the globe, has been so great, that it becomes absolutely necessary to define with greater accuracy the limits, not only of genera, but of species, and where this can be accomplished upon sufficient evidence, much will be done towards removing the confusion that exists in many cases; but even should the author of these Illustrations succeed in only a few instances, he hopes to render some service, though it be not very great, towards the advancement of the science of Botany.

A portion of the text that has first appeared, and will be continued at different intervals in the "London Journal of Botany" under the title of "Contributions to the Botany of South America," is here reprinted with a few alterations, and a description in detail of the several plates offered as "Illustrations" of these respective subjects, will be given at the end of each part; these will be drawn on stone by the Author, who claims much indulgence for the many imperfections attending his first attempt at any work of the kind.

Hammersmith,
July, 1846.

DESCRIPTION OF THE PLATES.

PLATE I. exhibits a drawing of *Salpichroa* (*Perizoma*) *rhomboidea*.

Fig. 1, is a transverse section across the lobes of the corolla in bud, to show its mode of æstivation. *Fig.* 2, the corolla cut open, exhibiting the stamens and the fleshy woolly ring at base. *Fig.* 3, a vertical section of the corolla and calyx, showing the perigynous woolly ring, the fleshy hypogynous disc, ovarium, style, and stigma, as well as the stamens in their natural position. *Fig.* 4, the stamens seen in three different points of view. *Fig.* 5, a grain of pollen, *highly magnified*. *Fig.* 6, the ovarium surrounded by its fleshy disc, the style and the stigma. *Fig.* 7, a vertical section of the ovarium, style and stigma. *Fig.* 8, a transverse section of the ovarium:—*all magnified*. *Fig.* 9, seed, *nat. size*. *Fig.* 10, the same *magnified*, exhibiting the hairy testa. *Fig.* 11, the same seen edgeways. *Fig.* 12, a section of the seed, showing the albumen and embryo. *Fig.* 13, the embryo extracted:—*all magnified*.

PLATE II, is a representation of *Dunalia Lycioides.*

Fig. 1, is the flower. *Fig.* 2, the calyx, style and stigma. *Fig.* 3, the ovarium, style and stigma. *Fig.* 4, the corolla cut open :—*all natural size.* *Fig.* 5, the upper portion of the corolla, *magnified,* showing the intermediate tooth and the mode of æstivation of its lobes. *Fig.* 6, the stamens seen in different positions, together with the mode of dehiscence of the anthers: the central portion of the filament is shown adnate to the tube, while the margins are free to the base, as well as the lateral setose teeth. *Fig.* 7, the stigma, front and side view. *Fig.* 8, is a transverse section of the ovarium :—*all magnified.*

PLATE III, is a drawing of *Acnistus cauliflorus.*

Fig. 1, the calyx. *Fig.* 2, section of the calyx, showing the pistillum. *Fig.* 3, the corolla. *Fig.* 4, the corolla cut open :—*all nat. size.* *Fig.* 5, corolla cut open :—*magnified.* *Fig.* 6, transverse section of bud, to show the mode of æstivation. *Fig.* 7, articulated hairs seen on the corolla and other parts of the plant. *Fig.* 8, stamens, front and side view, before and after dehiscence. *Fig.* 9, transverse section of anther, before dehiscence. *Fig.* 10, transverse section of anther, after dehiscence :—*all magnified.* *Fig.* 11, a grain of pollen :—*highly magnified.* *Fig.* 12, ovarium, style and stigma. *Fig.* 13, transverse section of the ovarium :—*all magnified.* *Fig.* 14. seed:—*nat. size.* *Fig.* 15, seed, *magnified.* *Fig.* 16, vertical section of seed. *Fig.* 17, transverse section of seed. *Fig.* 18, embryo, enveloped in albumen. *Fig.* 19, embryo extracted :—*all magnified.*

PLATE IV. A, exhibits *Himeranthus runcinatus.*

Fig. 1, flower. *Fig.* 2, calyx. *Fig.* 3, corolla. *Fig.* 4, corolla cut open, showing the hairy lines beneath the almost sessile stamens. *Fig.* 5, the anthers seen in different posi-

tions, showing the enlarged fleshy connective. *Fig.* 6, the calyx, ovarium, style and stigma. *Fig.* 7, pistillum. *Fig.* 8, the articulated hairs seen in the corolla.

B, exhibits *Himeranthus tridentatus.*

Fig. 1, one of the lobes of the corolla. *Fig.* 2, the pistillum.

PLATE V. A, represents *Himeranthus erosus.*

Fig. 1, corolla, cut open. *Fig.* 2, stamens, seen in different positions. *Fig.* 3, pistillum.

B, drawing of *Jaborosa integrifolia*, copied from Sir Wm. Hooker's figure in the Bot. Mag. tab. 3489, showing the much longer tube, and larger corolla, with its style far exserted, having 5 long linear lobes.

Fig. 1, pistillum, showing its stigma, sometimes having only three lobes. *Fig.* 2, stigma with five distinct lobes, *nat size.* *Fig.* 3, sessile anther, with its apiculated connective.

PLATE VI, A, is a representation of *Dorystigma caulescens.*

Fig. 1, the corolla, cut open. *Fig.* 2, stamens, before dehiscence. *Fig.* 3, stamens, after bursting. *Fig.* 4, transverse section of the anther in each stage:—*all magnified.* *Fig.* 5, a grain of pollen:—*highly magnified.* *Fig.* 6, calyx and pistillum, *nat. size.* *Fig.* 7, a front and side view of stigma, *magnified.* *Fig.* 8, the berry. *Fig.* 9, a seed:—*both nat. size.*

B, exhibits *Dorystigma squarrosum.*

Fig. 1, corolla, cut open. *Fig.* 2, stamens, before dehiscence. *Fig.* 3, stamens, after bursting. *Fig.* 4, calyx, ovarium, style, and stigma, seen in front. *Fig.* 5, style and stigma seen sideways. *Fig.* 6, a berry. *Fig.* 7, transverse section of a berry. *Fig.* 8, the dissepiment, with its central

placenta. *Fig.* 9, a berry seen edgeways. *Fig.* 10. seeds:—*all nat. size.* *Fig.* 11, seed, *magnified.* *Fig.* 12, section of seed. *Fig.* 13, embryo extracted from the albumen.

PLATE VII. is a drawing of *Trechonætes laciniata.*

Fig. 1, the calyx. *Fig.* 2, lobe of the calyx. *Fig.* 3, corolla. *Fig.* 4, corolla, cut open, showing the filaments, entirely free to the base:—*all nat. size.* *Fig.* 5, stamens, seen in different aspects:—*magnified.* *Fig.* 6, the ovarium, style and stigma:—*natural size.* *Fig.* 7, the style and stigma, seen in two positions. *Fig.* 8, articulated hairs, seen especially in the flower, peduncle, and petiole:—*all magnified.* *Fig.* 9, a grain of pollen:—*highly magnified.*

PLATE VIII, represents a portion of a branch of *Pionandra* (*Ceratostemon*) *floribunda.*

Fig. 1, is an expanded flower, seen from above. *Fig.* 2. a side view of the same. *Fig.* 3. the calyx. *Fig.* 4, a section of the corolla, with its stamens removed, showing the annular fleshy ring:—*all nat. size.* *Fig.* 5, three of the stamens, upon a portion of the fleshy ring, showing the mode of their origin: *slightly magnified.* *Figs.* 6, 7 and 8, are stamens, seen under three points of view. *Fig.* 9, transverse section across the stamen, showing the position of the anther cells with the connective. *Fig.* 10, a grain of pollen, *more highly magnified.* *Fig.* 11. ovarium, style, and stigma, showing the fleshy lobes in the mouth of the cavity. *Fig.* 12, vertical section of the style and stigma. *Fig.* 13, is a transverse section of the ovarium:—*all magnified.* *Fig.* 14, transverse section of the ovarium, *more highly magnified*, to show the mode of placentation. *Fig.* 15, a berry of *Pionandra ciliata*, *natural size*, but not yet arrived at its full growth.

J. Miers lithog.

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Salpichroa (Perizoma) rhomboidea.

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Dunalia lycioides

J Miers lithog

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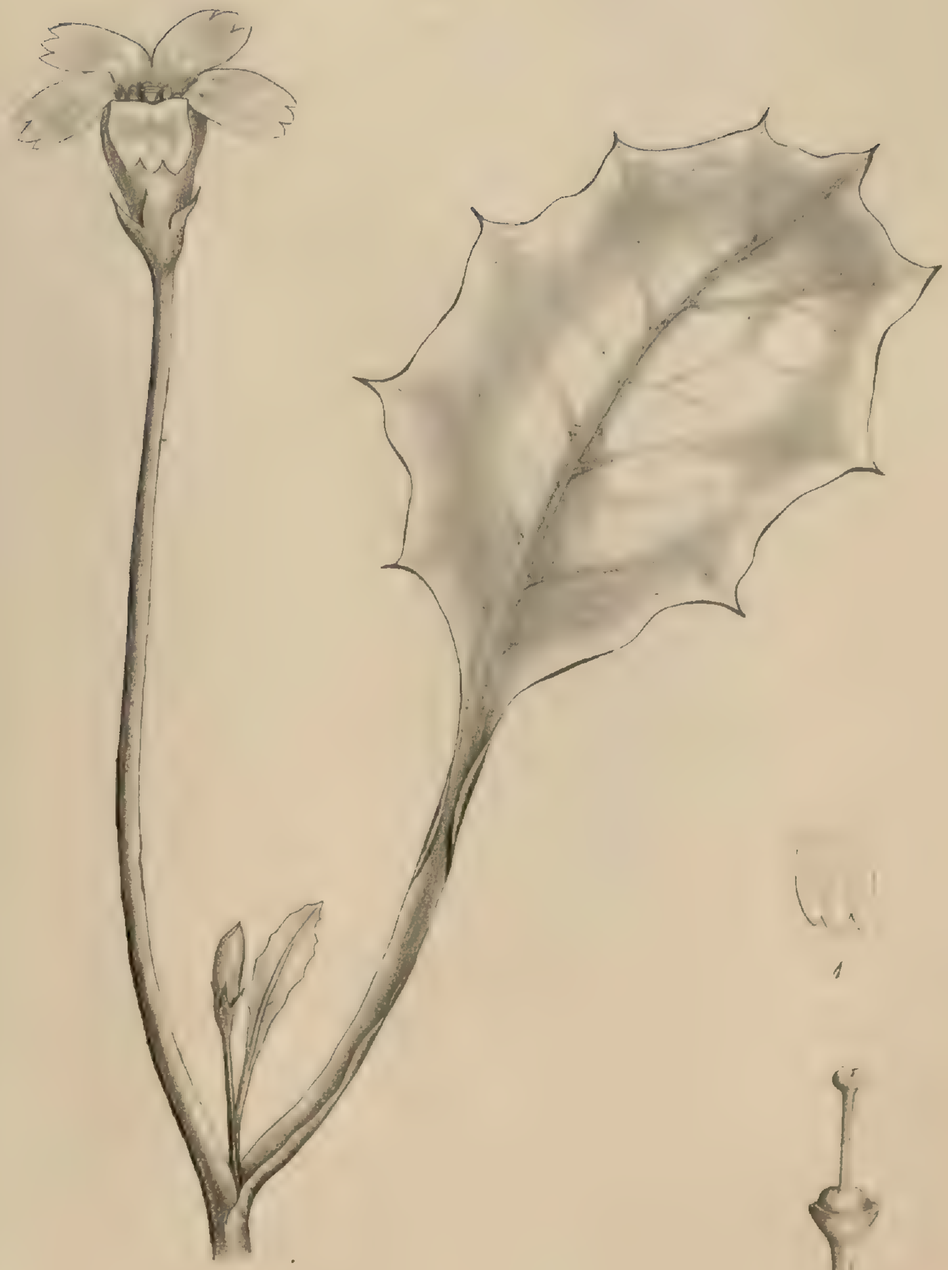
Acnistus cauliflorus.

A

J. Mees. Lithog

Ilmeranthus mucronatus

B



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Ilmeranthus tridentatus.

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Jaborosa integrifolia.

Humerarthus crocus.

Dorystigma caulescens.

Dorystigma squarrosum

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Trechonætes laciniata.

Miers lithog

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Pionandra (Ceratostemon) floribunda.

ILLUSTRATIONS

OF

SOUTH AMERICAN PLANTS.

Salpichroa.

Under this name it is proposed to class several plants that have been hitherto arranged in *Atropa*, the limits of which genus remained for a long while undefined, many species having been referred to it, and again removed by different botanists. Its character, as given by Professor Spenner (Gen. Pl. Germ. p. 21, tab. 18) upon the typical species A. *Belladonna* is deficient in so far as regards all the South American species. That offered by Prof. Endlicher (Gen. Pl. n. 3857) has evidently been framed with the intention of embracing the whole of these, amounting to about ten, which, however, include two other very distinct forms; of these, four will be classed in *Salpichroa*, and the remaining six under the name of *Hebecladus*.* The plants before mentioned possess a calyx

* They are all remarkable for their conspicuous flowers presenting an intermediate tooth in the plicature between the lobes of the corolla. The generic name of *Hebecladus* is derived from *ηβη*, *pubes*, *κλαδος*, *ramus tener*, in allusion to their habit, which much resembles that of *Salpichroa*, but is more suffruticose. The following elements for a generic character have been taken from the species I have examined in the dried state.

Hebecladus. (gen. nov.) Calyx brevis, profunde 5-partitus, laciniis ovatis submembranaceis, 1-nerviis, venosis, persistens. Corolla infundibuliformis, tubo amplo calyce 2-6 plo longiori, fauce ampliato, limbo patenti-

that scarcely enlarges, and that is usually cleft, almost to the base, into five linear erect segments, not a campanulate,

sinuato, 5-lobo, lobis acutis, sæpissime dentibus interjectis, æstivatione basi valde plicatis. Stamina 5, imo corollæ inserta, filamentis filiformibus, glabris, basi dilatatis, antheris exsertis, cordato-oblongis, adnatis, 2-lobis, longitudinaliter dehiscentibus, polline albido. Ovarium subrotundum, glabrum, (disco nullo?), 2-loculare, placentis dissepimento adnatis, pluri-ovulatis. Stylus simplex, exsertus. Stigma clavato-capitatum, sub 2-lobum. Bacca globosa, parva, calyce membranacea suffulta. Semina plurima in pulpam nidulantia, compressa, reniformia, testa reticulata. Embryo intra albumen carnosum hamato-arcuatus, cotyledonibus semiteretibus; radiculi tereti, infernè paulo crassiora, duplo longiori, hilum petente. Suffrutices *Americæ intertropicæ*, ramulis *subdichotomis, flexuosis, teneris;* foliis *plerumque geminis, altero vix minori, ovatis, ellipticis, vel cordatis, integris, petiolatis.* Inflorescentia *pedunculo solitario laterali, cernuo, floribus* 1-2 *vel plurimis, umbellatis, rubris, flavis, vel rubro viridescentibus.* Bacca *alba, pisi magnitudine.*

1. Hebecladus *viridiflorus*. Atropa viridiflora. *H. B. K.* 3, 11, *tab.* 196; Caule fruticoso volubili, foliis geminis, elliptico-ovatis, subacuminatis, integerrimis, basi in petiolum decurrentibus, utrinque (præsertim subtus) hirtellis; pedunculo bifloro; floribus nutantibus; corolla calyce 3-4 plo longiori, basi externe tuberculis 5 instructa.—**Nova Granada.**

Specimens of this plant exist in the herbarium of Sir William Hooker, collected by Professor Jameson on the Western side of the Volcano of Pichincha, at an altitude of 13,000 feet; by Colonel Hall, in the Valley of Lloa, who describes it as a large shrub; and again by Professor Jameson in Columbia (n. 195); and by Goudot, at Bogota in New Granada. The leaves are 3 inches long, and $1\frac{1}{4}$ inch broad, on a petiole $\frac{1}{2}$ inch long; peduncle 1-2 flowered, the calyx is somewhat pentagonous, and deeply cleft into 5 thin greenish triangular segments, with ciliate margins; the corolla is slightly pubescent; the filaments are wholly free to the base, where they have a short triangular dilatation, which is ciliate, above this they are slender and quite glabrous; the anthers are cordate at base, apiculate at summit.

2. Hebecladus *umbellatus*. Atropa umbellata. *R. & P.* 2, 44, *tab.* 181, *a.*; caule frutescente, flexuoso fragili; foliis subgeminis, cordato-ovatis, subangulatis, pubescentibus; pedunculo axillari, laterali, umbellato, multifloro, nutante; corolla mellifera, purpurea, limbo reflexo, ciliato, luteo, plicaturis vix dentatis; staminibus inclusis; stylo exserto; bacca albida, calyce patenti suffulta.—Peruviæ collibus circa Limam et Chancay. *v. s. in Herb. Hooker.* Amancaës prope Limam (*Matheus*, n. 722). A small shrubby plant; the leaves are not only somewhat angularly sinuate, but have eroso-denticulate margins.

5-partite calyx, with stellately patent lobes, increasing considerably in size with the fruit; it has a narrow tubular fleshy corolla, often contracted in the mouth, not one that is cam-

3. Hebecladus *biflorus*. Atropa biflora, *R. & P.* 2, 44, *tab.* 181, *b.* Pubescens; caule fruticoso, ramis glabris, nutantibus; foliis ovatis, acutis, superioribus geminatis, utrinque glabris, subtus pallidis, venis prominentibus; pedunculis hirtellis, 2-floris, nutantibus; corollâ purpurascente, tomentoso-pilosa, limbo luteo-viridi; staminibus exsertis, antheris cæruleis, sagittatis; bacca depresso-rotundata, alba, calyce patenti suffultâ.—In Andibus Peruviæ. *v. s. in Herb. Hooker.* Obrajillo et Cuallay ad Vallem Cantæ (*Mathews*).
4. Hebecladus *bicolor*. Atropa bicolor, *R. & P.* 2, 45; caule fruticoso; ramis teneris, angulatis; foliis plerumque geminatis, ovatis, acutis, angulatis, glabris; pedunculo axillari laterali, umbellato, 3-4-floro. corollâ rubicundâ, limbo viridescente.—In Andibus Peruviæ.
5. Hebecladus *asperus*. Atropa aspera. *R. & P.* 2, 45.; caule herbaceo, dichotomo; foliis geminis, ovatis, altero minori, asperis; floribus solitariis, cernuis; corollâ luteo-cærulea, fauce violacea, campanulatâ; filamentis hirsutis, violaceis; bacca alba.—Amancaës prope Limam.
6. Hebecladus *intermedius*, (sp. nov.); caule glabro; foliis ovatis, angulato sinuatis, margine erosis, utrinque parce pilosis, venis pulverulentis; umbella triflora; corolla tubulosa, floccoso-hirtella, lobis 5 sublinearibus, dentibus interjectis; antheris sagittatis, longe exsertis, filamentis gracilibus, glabris.—*v. s. in Herb. Hooker.* Purruchuco Peruviæ. (*Mathews*, n. 524. sub nomine *Atropæ asperæ, R. & P.*)

This plant, in the shape of its leaves, approaches A. *aspera*, R. & P., but they are by no means asperous; the flowers differ much from the figure of that species, resembling more those of A. *biflora;* the leaves are 3¾ inches long, and 1¾ inches broad, on a petiole ¾ inch long; the stem of the umbel is ½ inch long, the pedicels being 10 lines, the calyx is 4 lines, the tube of the corolla 1 inch, the border 4 lines in length.

7. Hebecladus *lanceolatus*, (sp. nov.); caule flexuoso, glabro, subangulari; foliis geminatis, altero minori, lanceolato-ellipticis, basi cuneatis, apice acuminatis, petioloque utrinque parce molliter hirtellis; umbella in axillis laterali, 4-flora; calycis margine floccoso; corollæ tubo rubello, glabro, ore flavo, 5-lobo, lobis acutissimis, puberulis, dentibus tot conspicuis, acutis, interjectis; staminibus inclusis; stylo exserto, clavato. —Columbia, *v. s.* in Herb. Hooker (*Hartweg*, n. 1301).

The leaves of this species are 3¼ inches long, and 1½ inch broad, on a petiole ½ inch long; the stem of the umbel is 1¾ inch, and the pedicels 9 lines in length. The flowers are of similar size to those of H. *viridiflora*.

8. Hebecladus *Turneri*, (sp. nov.) Caule flexuoso, tereti; foliis geminis,

panular, veined, thin in substance, and widened in the throat; its filaments are short, slender, and inserted in the middle, not in the bottom of the corolla; the anthers are linear, erect, nearly exserted, not oval and reflexed in the middle of the tube; its ovarium is deeply imbedded in a large coloured fleshy disc, not wholly free, or at least supported on a small 5-lobed ring. The stigma is clavate, almost cup-shaped, not deeply sulcated, 2-lobed, and reflexed. The berry is of a bright scarlet colour, not greenish or black. The testa of the seed is rugous, and covered with rigid hairs, not smooth and reticulated: characters offering many well marked points of distinction from *Atropa*. There is another remarkable difference between *Atropa* and *Salpichroa*; in the one, the corolla is thin, becoming membranaceous and unchanged in drying, while that of the other is thick and fleshy, becoming black as it dries, a character it possesses in common with most of the *Jaborosa* group, such as *Jaborosa*, *Himeranthus*, *Dorystigma*, and by *Juanulloa*, &c. The name is derived from σαλπιγξ *buccinum*, χροα colour, in allusion to its pretty, trumpet-shaped flowers, and the following are its generic characters.

Salpichroa. *Calyx* persistens, sæpissimè profunde 5 partitus, lobis linearibus acutis, fructifer haud mutatus, rarius 5-fidus. *Corolla* hypogyna, subcarnosa, infundibuliformis,

æqualibus, ovatis, acutis, basi late rotundatis, in petiolum decurrentibus, utrinque pilis mollissimis sparsis; umbella cernua, 6-8 flora; calycis laciniis lanceolatis, pubescentibus; corolla parva, glabra, aurantiaca, lobis acuminatis, margine floccosis; staminibus brevibus, inclusis; stylo exserto; bacca rubra calyce patenti suffulta.—Patria ignota.

This specimen exists in Sir W. Hooker's Herbarium, evidently dried from a cultivated species by Dawson Turner, Esq. without any note of its origin or the place of its growth. The leaves are 3½ inches long, and 2½ inches broad; the stem of the umbel is 4 lines, the pedicels 6 lines, the corolla 6 lines long, the latter being of an orange colour, rather broad in proportion.

Species dubia.

9. Hebecladus *hirtellus*. Atropa hirtella. *Spr.* 1, 699. Ramis asperis; foliis ovato-oblongis, acutis, scabris; pedunculis elongatis, 1-floris, filiformibus.—Brazil.

interdum tubulosa, fauce subconstricta, limbo 5-fido, lobis lineari-oblongis, reflexis, æstivatione ferè induplicatis, marginibus floccosis, vix introflexis. Stamina 5, æqualia, subexserta; filamenta filiformia, glabra, medio corollæ orta. Antheræ lineares, erectæ imo dorsi affixæ, liberæ, circa stylum conniventes, 2-loculares, loculis parallelis adnatis, rimâ longitudinali dehiscentibus. Ovarium liberum, conicum, disco carnoso magno colorato suffultum, 2-loculare, placentis centralibus, è dissepimento formatis, multiovulatis. Stylus simplex, filiformis, erectus, stamina excedens, basi conicus. Stigma subcapitatum, depressum, cavum, obsolete 2-lobum. Bacca ovalis, carnosa, 2-locularis, stylo apiculata. Semina numerosa, in pulpam nidulantia, rhomboideo-rotundata, valde compressa, testa rugosa, utrinque (præsertim versus marginem) pilis simplicibus rigidis dense vestita, hilo marginali. Embryo intra albumen carnosum arcuatus; cotyledonibus semiteretibus; radiculâ tereti hilum spectante.—Herbæ *Americæ meridionalis puberulæ, diffusæ, ramosæ, subscandentes;* caule *angulato, flexuoso, suffruticoso;* ramis *foliis oppositis.* Folia *solitaria, vel gemina, rarius terna, integra, in petiolum longum decurrentia.* Flores *solitarii, albidi, vel lutei, siccitate nigricantes, pedunculati, demum cernui.* Bacca *rubra.*

§ I. Eusalpichroa. *Corolla longe tubulosa, intus imo glabra.*

1. Salpichroa *glandulosa.* Atropa glandulosa. *Hook. Bot. Misc.* 2.230. *Hook. Icon.* 106; caule fruticoso, suberecto; foliis geminis, longe petiolatis, cordato-ovatis, glanduloso-pubescentibus, sæpe incano-tomentosis; calyce pubescente, profunde 5-partito, laciniis linearibus; corolla flava, longe tubulosa, staminibus styloque inclusis.—Pasco Peruviæ.
2. Salpichroa *dependens.* Atropa dependens. *Hook. Icon.* 107; caule suffruticoso, pendente; foliis geminis, cordato-ovatis, breviter petiolatis, fere glabris, subtus pallidis; calyce tubuloso, tenui, pubescente, 5-fido, demum fructifero subampliato hinc fisso; corolla longe tubulosa, stylo staminibusque exsertis.—Peruvia (*Mathews*, n. 829).

3. Salpichroa *hirsuta*. Atropa hirsuta, *Meyen* (*Reise um die Erde*, 1, 466). *Nees ab Esenb.* (*Nov. Act.* 19, *Suppl.* 1, 389); caule suffruticoso, ramosissimo, diffuso; foliis geminis, subcordato-ovatis, longe petiolatis, calycibusque profunde 5-partitis, hirsutis; corolla tubulosa, antheris cum styli apice exsertis.—Peruvia, circa Pisacomam, altitudine 15,000 ped.

This appears to be the same plant, of which many specimens exist in the herbarium of Sir William Hooker from various localities, viz:

Pichincha (*Jameson*, n. 32), Pichincha (*id.* n. 301), Columbia (*Hartweg*, n. 1311). In these the stem is 4-angular, flexuose; the leaves are solitary, geminate, and ternate, from ½ to 1 inch long, and 4 to 9 lines wide; the petiole is nearly as long as the leaf, slender, and caniculate; the internodes are about the length of the leaves; the flowers are solitary and lateral; the corolla about ten lines long, tubular, of a greenish yellow colour, glabrous, having oblong obtuse lobes, with floccose margins; the oval berry is terminated by the persistent glabrous style. Andes of Peru (*M'Lean*), where the leaves are more ovate, nearly glabrous above, pubescent beneath, the margins being somewhat crenate. Andes of Quito (*Jameson*, n. 125), of more stunted growth, a flexuose stem, presenting many short knotty leafless internodes; leaves ternate, barely 3 to 4 lines long, 2 to 3 lines broad, petiole 3 to 5 lines long. Bogota (*Goudot*), very near the last; the branches are somewhat more divaricate, and of a darker reddish colour.

4. Salpichroa *ramosissima*, sp. nov.; caule fruticuloso, 4-gono; axillis annotinis nodosis; ramulis pubescentibus; foliis utrinque glabriusculis, geminis ternisque, æqualibus, submembranaceis, elliptico-oblongis, basi rotundatis, in petiolum gracilem decurrentibus, apice subacuminatis, margine ciliatis; floribus solitariis lateralibus; corolla tubulosa, calyce 3plo longiori, fauce contracta, lobis acutiusculis, reflexis, margine velutinis.—Purruchuco, Peruviæ. v. s. in Herb. Hooker (*Mathews*, n. 1053 *sub nomine* Atropæ ramosissimæ).

A very distinct species, both in the form of the leaf and the shape of the corolla; the leaves are 1½ inch long, 7 to 9 lines broad, the petiole, which is slender and caniculate, being ½ inch long; the lobes of the calyx are narrow, almost linear, and slightly hairy; the berry is red, of an oval shape, ¾ inch long, ½ inch in diameter; the seeds are flattened, with a hairy testa resembling that recorded in the following section.

§ Perizoma. *Corolla brevis, medio et fauce constricta, intus annulo carnoso lanato instructa.*

5. Salpichroa *rhomboidea*. Atropa rhomboidea. *Hook. Bot. Misc.* 1, 135, *tab.* 37.; foliis rhomboideo-ovatis, basi rotundatis in petiolum attenuatis, fere glabris, margine petioloque ciliatis, interdum valde pubescentibus,—Bonaria. *Busbeckia*, sp. Mart. MSS.

I met with this species in 1825, when its details were recorded by drawings from the living plant; it was also collected about the same time by Dr. Gillies, from whose specimens Sir William Hooker gave the excellent figure and description above quoted. I had long ago separated this from *Atropa* as a distinct genus under the name of *Perizoma*, and had prepared a drawing to exemplify it; but upon examining with more attention the species of the foregoing section that exist in Sir William Hooker's herbarium, I was led to the conclusion that it is better to place it as a distinct section of *Salpichroa*, on account of the close resemblance of the most essential characters of the flower and the seeds; the presence of the hairy perigynous ring and the different size and shape of the tube of the corolla not offering more than a sectional difference.

This is a weak plant trailing among bushes, or on the ground. The stem is slender, sub-4-angular, somewhat flexuose. The leaves are sometimes almost glabrous, often slightly pubescent on both sides, with very short articulate hairs, the margin and petiole being ciliated. The flowers are usually solitary (or geminate when the axils present ternate leaves); they are cernuous upon slender pubescent lateral

peduncles. The calyx is deeply cleft into 5 long sharply-pointed, almost linear erect segments; it is slightly pubescent and persistent, it does not increase much in size nor become patent as the fruit ripens. The corolla is short and tubular, broad in proportion, quite white and smooth, and sensibly contracted both in the middle where the filaments are inserted, as well as in the mouth; the segments of the border are narrow, acuminated and reflected; the æstivation is slightly induplicate, the inflected edges adhering by their woolly margins; near the base of the tube is seen a somewhat fleshy ring, which is covered with long, woolly, white, articulated hairs. The stamens are equal, short, slender, and glabrous; the anthers, converging around the style above the mouth of the tube, are narrow, linear, 2-locular, with parallel adnate cells, which burst longitudinally somewhat laterally; the pollen is yellow and farinaceous, and when seen in the microscope, both in the dried and humid state, is globular with 3 salient obtuse equidistant points. The ovarium is pyramidal, its base being deeply enveloped by a conspicuous fleshy orange-coloured disc; the style is conical at base, above which it has a broad band of long white hairs, and is quite smooth towards the summit, which rises a little above the anthers; the stigma is rather large, clavate, somewhat hollow, cup-shaped, and fleshy. The berry is of an oblong form, of a bright scarlet colour, about $\frac{1}{2}$ an inch long, and $\frac{3}{8}$ wide, apiculate at the summit with the persistent base of the style; it contains from 16 to 20 rather large dark brown seeds, enveloped in pulp; these are of a roundish square form, greatly flattened, with a small hilum on the marginal edge; the testa is hard, brittle, and rugous, both its surfaces, and especially the margin, being densely set with long rigid simple hairs; the albumen is fleshy rather compact, and encloses a nearly annular, filiform, embryo; the radicle is about one-third the length of the embryo, and points towards the hilum, the cotyledons being semiterete and arcuate.*

* A representation of the above species is shown in Tab. 1. an explanation of its details being given in the description that accompanies it.

I found this plant at several places in the Pampas, at a distance of nearly 600 miles in the interior, and afterwards near Buenos Ayres; and although these differ very much in appearance, I can hardly venture to designate them as distinct species; they are therefore added merely as varieties.

Var. β. *divaricata*; caule flexuoso, valde divaricatim ramoso, foliis obovatis, minoribus, utrinque pilosiusculis.—Pampas, ab Esquina de Medrano usque Frayle muerto, Provinciæ Cordovensis.

This plant is of more straggling habit, the branchlets spreading very widely, and the leaves scarcely exceeding ½ to ¾ of an inch in length, the stem being 4-angular and pubescent.

var. γ. *pubescens*.—caule 4-gono; foliis fere ovalibus, rotundatis, utrinque valde pubescentibus, petiolo gracili.—Pampas, San Luiz usque Rio Quinto.—This presents a very different appearance to the last variety; the leaves being about the same size, but the petiole is much longer and more slender.

6. Salpichroa *ciliata*. Lycium ciliatum, *Schl. Linn.* 7, 70:—suffruticosa, subscandens, ramis elongatis, flexuosis, ramulis interdum subspinescentibus; foliis sparsis, inæquilateris, rotundato-ovatis, interdum subcordatis, in petiolum attenuatis, apice brevissime acuminatis, utrinque glabris, margine denticulato-ciliatis; floribus axillaribus, solitariis, brevissime pedunculatis, cernuis, calycis laciniis linearibus, acutis; corolla puberula, infundibuliformi, genitalibus exsertis.—Rio Negro, Banda Oriental (Sellow).

From Professor Schlechtendahl's description, it is evident that this plant has a close affinity to the foregoing. The leaves are 1½ inch long, 16 to 18 lines broad; the peduncle is 1½ to 2 lines long, erect, and curving downward; the calyx is deeply cleft into 5 linear segments, is covered with short glandular pubescence, and the margins are ciliated with glandular hairs. The corolla, somewhat longer than the calyx, is downy externally with glandular hairs, (articulate?), funnel-shaped, the segments of the border are triangular, rather obtuse, reflexed, with glandular ciliate margins; the stamens

and style are far exserted, the filaments being inserted above the base of the corolla, where the tube is contracted, and closed internally by a ring of dense villous hairs. The berry is red, globose, and shorter than the persistent calyx, which increases in size to the length of 5 lines. The seeds are numerous, whitish, compressed, subreniform, but were not ripe when seen.

DUNALIA.

Among the plants sent from Peru by Mathews is one marked *Lycium obovatum*, but it is clearly not the one figured under that name in the Flora Peruviana.* In its

* I have searched in vain for this plant in the herbarium of Ruiz and Pavon in the British Museum, nor can I find it elsewhere. In the herbarium of Sir Wm. Hooker there are, however, three plants from central America that bear much resemblance to it. It cannot be a true *Lycium* on account of the æstivation of its corolla which is valvato-plicative (not imbricate) and its lobes are acute with pubescent margins (not rounded and smooth); it appears to me that with some others I shall point out, these will form a distinct group; they possess a habit widely different from *Lycium*, although they are all spiny shrubs, generally with 1 or 2 violet or crimson flowers growing out of the fascicles of rather small fleshy leaves that cluster upon the spines; the corolla is usually broader and more tubular than in *Acnistus* or *Lycium*, with stamens often unequal and included; the calyx has generally acute lobes, and is not pentagonous with obtuse lobes as in *Acnistus*. They offer much resemblance in external appearance to the species of *Dunalia*, above described, but they want the intermediate tooth in the corolla and the appendiculate stamens of that genus. I propose to call them by the name of *Lycioplesium* from *Lycium*, and πλησιον, *approximatus*. It may be said that they should, like the *Lyciobatos* of Endlicher, form a distinct section of *Lycium*, but on account of the æstivation of the corolla, the generic character, so altered to admit of them, would necessarily include *Acnistus*, *Salpichroa*, *Chænesthes*, and *Iochroma*; genera decidedly inadmissable. The following is therefore offered as the generic character.

LYCIOPLESIUM, (gen. nov.) *Calyx* ovato-campanulatus, 5-dentatus, persistens. *Corolla* tubulosa, limbo 5-partito, æstivatione lobis acutis, valvato-plicatis, margine tomentosis. *Stamina* 5, corollæ longitudine, ultra basin inserta, subinæqualia, *filamentis* insertione villosis, vel omnino glabris; *antheris* oblongis, 2-lobis basi cordatis longitudine dehiscentibus. *Ovarium* obovatum, 2-loculare, placentis e dissepimento forma-

spiny habit it greatly resembles a *Lycium* or *Grabowskya*, but, on examining the flowers I, found it to possess all the essential characters of *Dunalia*. The genus *Dunalia*, founded

tis, multi-ovulatis. *Stylus* simplex. *Stigma* bilobo-capitatum. *Bacca* calyce inclusa. *Semina* numerosa, parva, compressa, reniformia, albuminosa; *embryo* cylindricus, annularis.

Frutices Americæ meridionalis *glabri vel tomentosi spinosi;* folia *crassiusculæ, oblonga, in petiolum basi angustata, in spinis junioribus subfasciculata;* flores *pedunculati* (1-2) *in quoque axilla;* corollæ *violaceæ vel rubescentes;* baccæ *rubræ vel aurantiacæ.*

1. Lycioplesium *obovatum*. Lycium obovatum, *R.* & *P.* 2.46 : tab. 183. *c.*—glaberrimum; ramis patentibus, aculeis rigidis, junioribus fasciculato-foliosis, adultis nudis; foliis obovatis, obtusis, crassiusculis, basi in petiolum decurrentibus; pedunculis solitariis, extra-axillaribus, 1-floris, nutantibus, corollis tubulosis, limbo erecto, marginibus floccosis.—Peruvia (Tarma).

A shrub 12 feet high, very smooth, leaves including the petiole 1½ inch, 7 lines broad; peduncles 7 lines long; calyx urceolately tubular, 2 lines long, with 5 short obtuse lobes, having a small mucro at the apex; corolla tubular, purplish violet, 9 lines long, lobes of border short, 3-angular, erect, with floccose margins; filaments glabrous, arising above the base of the tube where it is pubescent; anthers included within the mouth; the style is exserted; the berry is globose, orange coloured.

2. Lycioplesium *nitidum*, (n. sp.) :—fruticosum, spinosum; foliis alternis, ovato-oblongis, glaberrimis, crassiusculis, supra lucidis, subtus pallide glaucis, rarius in venis tomentosis, margine revolutis, apice obtusis et minute retusis, basi cuneatis, in petiolum brevem attenuatis; floribus binis, pedunculis apice incrassatis, corolla rubro-violacea, staminibus exsertis.—Columbia, Pulzhum, in valleculis latere occidentali. (*Jameson*) *v. s. in Herb. Hooker*).

The young shoots (about ½ inch long) from which the leaves and flowers spring, finally become converted into spines; the peduncle is 7 lines long, and thickened at its apex; the calyx is campanular, 2 lines long, about the same breadth, and has 5 short rounded teeth with a small mucronate acumen; the corolla is smooth, tubular, 10 lines long, with 5 small erect lobes with a mucronulate apex and floccose margins; the anthers are oblong, 2-lobed, cordate at base, yellowish green, affixed at base, the filaments being inserted above the base of the tube of the corolla, where it is densely pubescent.

3. Lycioplesium *ovatum*, (n. sp.):—fruticosum, ramis sub-flexuosis, spinosis, ferrugineo-tomentosis; foliis glaberrimis, crassiusculis, ovalibus, utrinque rotundatis, margine revolutis, supra lucidis, subtus pallidioribus, breviter petiolatis; floribus solitariis, extra-axillaribus; corolla glabra,

by Prof. Kunth on a shrubby plant with much the habit of a *Witheringia*, brought from the Cordillera of New Granada by Humboldt, was placed by that learned botanist among *Cestrineæ*, on account of the resemblance of its flowers to those of *Cestrum*, although he confesses he knew nothing of the form of the embryo of its seed. Until this fact be ascertained it remains doubtful whether it may not with equal reason be classed in *Solaneæ*, near *Salpichroa* or *Chænesthes*, which view is much favoured by its numerous ovules seen upon the thickened placenta on the dissepiment; but on the other hand it must not be forgotten that some analogy exists between the appendiculate processes of the filaments in this genus, and the singular projection often seen upon the fila-

rubro-flavida, tubo latiori, staminibus inclusis.—Nova Granada, (*Goudot.*) *v. s. in Herb. Hooker.*

This is a shrub 10 or 12 feet high, with leaves 11 lin. long, 7 lin. broad, petiole 2 lin.; corolla smooth both without and within, except at the place of the insertion of the filaments somewhat above its base, where it is tomentous; the lobes of the border are oblong, obtuse, mucronulate at the apex, and tomentous on the inflected margins; filaments glabrous, anthers 2-lobed, oblong, yellowish green, in the mouth of the tube; berry black.

4. Lycioplesium *horridum*. Lycium horridum, *HBK.* 3.52. Lycium parvifolium, *Wild, R. and Sch.* 14.698;—suffruticosum, spinosissimum; foliis fasciculatis, obovatis, obtusis, crassiusculis, nitidis; floribus solitariis, pendulis; corolla violacea, staminibus subinclusis.—Andibus Peruviæ circa Caxamarcam.

This is said to be a shrub 6 feet high, with many spreading, thick, leafless branches; branchlets an inch long, furnished with leaves at base, spinose at the apex; leaves fasciculate (4-7), petiolate, 4-6 lin. long (including the petiole 1 lin.) 2-2½ lin. broad; flowers subaxillary, peduncles 3-4 lin. long, filiform, and smooth; calyx semiglobose, obsoletely 5-toothed, nearly entire, smooth, with 5 small acute teeth, about 1 line long; corolla smooth, tubular, somewhat curved, 7 lines long, border with 5 equal, acute, spreading lobes with ciliate pubescent margins; stamens inserted at base of tube, and equal in length to the corolla, filaments smooth, anthers erect, oblong; ovarium conical, smooth; style filiform, smooth, rather longer than the stamens; stigma thickened, green.

5. Lycioplesium *Meyenianum*. Lycium (Grabowskya?) Meyeniana, *Nees ab Esenb. Nov. Act.* 19 *Suppl.* 1.390. Atropa spinosa. *Meyen, Reise um die Erde,* 1,416;—erectum, rigidum, spinosum; foliis lanceolatis, obtusis,

ment of some species of *Cestrum*, which appears as if two lateral lobes were agglutinated into one salient tooth.

The following is proposed for its generic character :

DUNALIA Kunth. (char. emend.)—*Calyx* urceolatus subpentagonus, 5-dentatus. *Corolla* hypogyna longe tubulosa 10-nervia, limbo 5-fido, lobis æstivatione marginibus floccosis vix induplicatis basi plicatis, dente mucronato erecto interjecto. *Stamina* 5 corollæ tubo inserta, inclusa vel exserta, filamentis basi dilatatis et pubescentibus, linea centrali tubo adnatis, marginibus membranaceis liberis, superne glabris, omnino liberis, 3-partitis, laciniis lateralibus linearibus acutis erectis, intermedio gracili antherifero ; antheris oblongis, 2-lobis, basifixis, longitudinaliter dehiscentibus.—*Ovarium* ovatum, 2-loculare, placentis crassis dissepimento adnatis, multi-ovulatis. *Stylus* simplex exsertus. *Stigma* eargimnato-capitatum. *Bacca* globosa, calyce suffulta, 2-locularis. *Semina* plurima, reniformia compressa. *Embryo* ignotus.

Frutices *Andicoli Americæ meridionalis intertropicæ ;* foliis *alternis petiolatis, geminis vel fasciculatis, glabris vel pubescentibus ;* floribus *subumbellato-fasciculatis vel solitariis, extra-axillaribus :* corollis *albis vel coccineis.*

1. Dunalia *solanacea*, HBK. 3.55. *tab.* 194. Dierbachia solanacea *Spreng. Syst.* 1.676.—inermis : ramulis tomentosis ; foliis alternis, ovato-oblongis, acuminatis, basi inæqualiter rotundatis, supra glabris, subtus incanis, stellato tomen-

glabris ; floribus solitariis, nutantibus ; calyce late campanulato, 5-dentato, 2-plo, 3-plo-ve longiore, corolla violacea, staminibus inclusis.—Peruvia, circa Pisacomam, altit. 15,000 ped.

A handsome shrub, said much to resemble the last mentioned species, but differing in its smaller lanceolate leaves ; branchlets covered with thick white tomentum, 1-1½ in. long, often spiny at the apex, bearing fascicles of leaves at the base ; peduncles axillary, smooth, 6 lines long ; calyx smooth, 3 lines long, with 5 short equal obtuse teeth, terminated by a woolly cuspidate point ; corolla tubular, 15 lines long, with a slightly spreading border, having 5 short triangular acute lobes with ciliate margins ; berry red, twice the size of a pea, globose, partly enclosed within the calyx, which now becomes unequally 3-4 cleft.

tosis; floribus umbellato-fasciculatis; corollis stellato-tomentosis.—Nova Granada.

The leaves are said to be about 10 inches long and 4 inches broad, on a petiole an inch in length; the calyx does not measure a line; the corolla is white, nearly an inch long with a narrow slender tube, the lobes of the border being ovate, and 1-nerved; the stamens are very short, and placed in the middle of the tube of the corolla, the lateral appendages equalling in length the intermediate antheriferous filament; the style is much longer than the corolla; the berry is globose, glabrous, about the size of a pea.

2. Dunalia *lycioides* (sp. nov.)—fruticosa, glaberrima; ramulis horrido-spinosis; foliis fasciculatis (1-2-3), lanceolato-spathulatis, obtusis, in petiolum decurrentibus; floribus (1-2) nutantibus, staminibus exsertis. — Peruviæ Prov. Canta, Tarma et Jauja. (*Mathews* n. 850) in herb. meo; etiam in herb. Hook. cum aliis Columbia (*Lobb.* n. 255) et Bolivia (*Pentland*).

This is described to be a shrub 6 or 8 feet high. The branches are flexuose, quite smooth with internodes scarcely an inch distant, and a single stout, sharp pointed, divaricate spine in each axil, 2 inches in length, the older ones being bare and sometimes again spiny; the younger ones bearing leaves and flowers. The leaves are smooth, fleshy, rounded at the apex, and tapering at base into the petiole, they are 9 lines in length and $2\frac{1}{2}$ lines wide; the peduncles are 4 lin. long; the calyx at first slightly pubescent, is urceolate, with 5 projecting ribs which terminate in as many short teeth, with a mucronulate woolly apex. The corolla is broader and about the length of the last species, being 10 lines long, smooth, of a crimson colour, having a border of 5 short, rather erect lobes, with floccose margins, and a narrow intermediate plicature with tomentose edges and a small erect tooth in the centre. The crimson filaments are adnate by a central line to the base of the tube of the corolla for one third of its length, the upper part being wholly free, the lateral appendages being short, acute, and only $\frac{1}{10}$th part of the length of

the antheriferous portion, which is slender and subulate; the anthers are oblong, yellow, protruding beyond the mouth of the corolla. The fruit is unknown.*

ACNISTUS. Schott.

This genus was first proposed by Schott in 1829 (Wiener Zeitschrift 4.1180) upon a Brazilian plant considered to be identical with the *Cestrum cauliflorum*, Jacq. *Hort. Schoen.* 3.41 *tab.* 325. Another species, also confounded with it, had been long previously known and figured by Plumier, under the name of *Belladonna frutescens* (*tab.* 46, *f.* 1). The authors of the Flora Peruviana have given a representation of a fourth species, under the name of *Lycium aggregatum*, (2.45. *tab.* 182. *f. a.*); but as the characteristic features of the genus are not delineated in the figures above quoted, nor any exact details have, to my knowledge, yet been published, I offer the following from my own observations.

ACNISTUS *Schott.* (char. reform).—*Calyx* campanulatus, sub-5-gonus, obsolete 5-dentatus. *Corolla* hypogyna, infundibuliformis, fauce sensim ampliato, limbo 5-partito, patento, reflexo, æstivatione lobis margine floccosis, valvato-induplicativis. *Stamina* 5, corollæ tubo supra basin inserta, *filamenta* simplicia; *antheræ* 2-lobæ, longitudinaliter dehiscentes, sæpe exsertæ. *Ovarium* e disco calycino ortum, 2-loculare, placentis crassis, dissepimento adnatis, pluri-ovulatis. *Stylus* simplex. *Stigma* capitatum, sub-bilabiatum. *Bacca* calyce suffulta, 2-locularis. *Semina* pauca, reniformia, compressa; testa rugosa, dura. *Embryo* intra albumen carnosum, hamato-arcuatus, cotyledonibus semiteretibus, radicula tereti, inferne crassiori fere duplo longiori, hilum spectante.

Frutices *Americæ tropicæ*, foliis *alternis, integris, junioribus aggregatis*; floribus *pedunculatis, in axillis sæpe annotinis,*

* A figure of this species is given in Tab. 2, an explanation of its details being given in the description that accompanies it.

fasciculatis, rarius in racemis terminalibus ; pedunculis *apice incrassatis.*

There is very little tenable ground for maintaining this genus, as hitherto constituted, distinct from *Lycium,* there being hardly any single character that is not equally common to both of them, excepting the hairy tuft at the base of the filaments in the one, (and that is a very inconstant feature), and the numerous fascicles of flowers in the cicatrices of the fallen leaves in the other. An important distinction will, however, be found to exist in the æstivation of the corolla. We have the respectable authority of Schlechtendahl and Schott, which has been acceded to by all succeeding botanists, that *Acnistus* possesses an imbricate æstivation. I cannot affirm this statement, for in the Brazilian species upon which Schott founded this genus, the lobes of the corolla unquestionably adhere by their tomentous margins, which are mutually and slightly turned in, a mode of æstivation observed in many arborescent species of *Solanum,* and very different from that of true *Lycium,* where the lobes of the corolla offer an imbricate or quincuncial æstivation. It therefore seems advisable to unite with *Acnistus,* several species hitherto combined with *Lycium,* forming part of the section called *Anisodontia* by G. Don, and *Lyciothamnos* by Endlicher; these mostly consist of spineless trees or shrubs, with large leaves, having flowers in umbellate fascicles, and I propose to confine within the limit of *Lycium* proper, those shrubs, mostly with small fasciculate leaves, whose branchlets terminate in spines, or have a tendency to do so, that have only 1 or 2 flowers in each axil, and with elements corresponding to the old generic character exhibited by Gärtner (*de fructu* 2.242), with the addition of the before mentioned æstivation.*

* The remaining species of *Lycium* in the section above alluded to, appear to me again distinct, approaching very closely to *Dunalia,* but as their filaments want the lateral appendages peculiar to that genus, I propose uniting them under the name of CHÆNESTHES, derived from *ιωνα dehisco, εσθης vestis ;* on account of its tubular calyx splitting by the growth of the fruit. This genus will comprise 5 species described by Prof.

It should be remarked that the flowers in most (and I believe in all) species of *Acnistus* possess a very sweet smell.

1. Acnistus *cauliflorus*, Schott;—foliis obovato-oblongis, utrin-

Kunth from the plants brought home from central America by Humboldt and Bonpland, together with another hitherto undescribed that exists in the herbarium of Sir Wm. Hooker; they are all trees or large shrubs, with abundant foliage, growing at great elevations in the vallies of the Andes, having generally long crimson, or orange coloured flowers of much beauty, the corolla presenting a 5-lobed border, with 5 small teeth in the intermediate narrow plicatures, as in *Dunalia*, and an unequally 5-toothed calyx, that somewhat enlarges with the fruit, and splits as above mentioned.

CHÆNESTHES.—*Calyx* tubulosus, inæqualiter obtuse 5-dentatus, sub 2-lobus, demum parum auctus, lateraliter fissus, persistens. *Corolla* hypogyna, nfundibuliformi-tubulosa, subincurvata, lobis 5-acutis, margine floccosis, æstivatione valvato-induplicativis, basi plicatis, dentibus brevibus interjectis. *Stamina* 5, subinclusa, filamentis basi adnatis, mox liberis, gracilibus, erectis, vix exsertis; antheris oblongis, basifixis. *Ovarium* ovatum, 2-loculare. *Stylus* gracilis, apice incrassatus, exsertus. *Stigma* clavato-bilobum. *Bacca* obovata, calyce hinc fisso inclusa. *Semina* numerosa, in pulpo nidulantia, rugosa, reniformia, cetera ignota.

Frutices *Andicoli Americæ intertropicæ*. Folia *alterna, petiolata*. Flores *speciosi, coccinei, vel aurantiaci*. Bacca *rubra*.

1. Chænesthes *fuchsioides*. Lycium fuchsioides. *H. B. K.* 3, 52. *Pl. Æquin. tab.* 42. *Bot. Mag. tab.* 4149. Fruticosa; foliis obovato-oblongis, obtusiusculis, glabris; umbellis extra-axillaribus, terminalibusque, sessilibus, multifloribus; pedicellis glabris, cernuis; calyce 2-lobo, sub 5-dentato, lobo altero 3-dentato, vel integro; corolla coccinea, glabra, filamentis basi villosis, dilatatis, inclusis. Quito (in vallem Lloæ), *Hall*, n. 7. Columbia, *Jameson. v. s. in Herb. Hooker.*

Bonpland describes this to be a shrub 10 or 12 feet high. The leaves are smaller than most of the other species, being only 2 in. long, and 9 lin. wide, broader towards the top, and narrowing gradually into a petiole of 6 lin. in length. The calyx is tubular, quite glabrous, about 5 lin. long, broadly 2-lobed, the one lobe having a single, sometimes two minute pubescent teeth, the other having three minute approximate teeth, which are downy; the flowers, according to Bonpland, are of a "beau rouge," while Colonel Hall states them to be "orange red;" they are about 1 inch long, tubular, glabrous, with a border of five somewhat erect lobes, with a small tooth in each intermediate plicature; the filaments are crimson, subulate, slightly hairy below, inserted near the base of the corolla; the berry is pyriform (not globular), and three times the length of that figured by Bon-

que attenuatis, basi cuneatis, in petiolum longum subdecurrentibus, integris, utrinque pubescentibus, demum subglabris, subtus pallidis; floribus fasciculatis, confertis, longe

pland, 9 lines long, enclosed by the enlarged calyx, which is cleft to the base on one side; the seeds are very numerous, but too unripe to discover the form of the embryo. The plant found by Prof. Jameson in Columbia is hardly to be distinguished from that of Col. Hall, except that in the latter, the stamens are somewhat exserted, and the calyx is divided into five nearly equal segments, being scarcely bilabiate; but that difference alone can hardly make it a distinct species. Prof. Jameson says it is found abundantly in the neighbourhood of villages (azogues), where it is used for fences. The cultivated specimens described by Sir Wm. Hooker (*Bot. Mag. tab.* 4149), exhibit larger and broader leaves and larger flowers, but the calyx is exactly that as above described from Columbia.

2. Chænesthes *umbrosa*. Lycium umbrosum. *H. B. K.* 3, 54. Fruticosa; ramulis hirto-pubescentibus; foliis oblongis, acuminatis, glabriusculis floralibus ovato-rhomboideis; floribus umbellato-fasciculatis, lateraliter extra-axillaribus; corollis coccineis, tubulosis, hirtellis; staminibus subinclusis; stigmate exserto, bilobo.—Nova Granada. Columbia (*Hartweg*, n. 1310). *v. s.* in Herb. Hooker.

The leaves are 3 in. long and 2¼ in. broad, the petiole being 1¼ in. long; the pedicels are 1¼ in. long, the calyx 5 lin. the corolla 1¼ in. long; the crimson filaments are adnate to the base for a length of 3 lines, where they are downy, thence they are free, tomentous, and dilated below, smooth and tapering gradually upwards; the style thickens considerably towards its summit.

3. Chænesthes *gesnerioides*. Lycium gesnerioides. *H. B. K.* 3, 53. Fruticosa; foliis ovatis, oblongisve, acutis, supra fere glabris, infra pulverulentis; floribus umbellato-congestis; calyce 5 dentato; corolla aurantiaca, pubescenti, filamentis pubescentibus.—Peruvia, Prov. Chachapoyas (*Matheus*). *v. s.* in Herb. Hooker.

In this species the leaves are about the size of C. *fuchsioides*, the flowers are in fascicles, with slender pedicels swelling at the summit, 1½ in. long and tomentous; the calyx is short, unequally 5-toothed, 2-lobed, the one having sometimes 3 teeth, often truncated; the corolla of an orange-red colour, is covered with soft, dense, yellowish down, and is 1¼ in. long; the anthers are half exserted; the style being somewhat longer, and the stigma capitate and bilobed.

4. Chænesthes *Loxensis*. Lycium Loxense, *H. B. K.* 3, 53. Arborea; ramulis pubescenti-tomentosis; foliis ovatis, acuminatis, utrinque puberulis; umbellis multifloribus, subaxillaribus et terminalibus, sessilibus; corollis flavis? tubulosis, pubescentibus, limbo 5-partito, lobis brevibus, dentibus minimis interjectis; staminibus inclusis.—Peruvia prope Loxam.

pedunculatis; corollis pubescentibus, staminibus breviter exsertis.—Rio de Janeiro et in Insulis Antillanis.

This species, which is widely disseminated throughout tropical South America, is considered by Schlechtendahl and others as identical with the three following; but as it differs in many respects, I have kept it distinct. The leaves are more

5. Chænesthes *cornifolia*. Lycium cornifolium, *H. B. K.* 3, 54. Arborea; ramulis canescenti-tomentosis; foliis subrotundato-ovatis, subacuminatis complicatis, supra puberulis, subtus molliter fuscescenti-tomentosis; floribus umbellato-fasciculatis, subaxillaribus; calyce pentagono, inæqualiter obtuse 5-dentato; corollis tubulosis, flavis? hirtellis; staminibus inclusis.—Quito.

6. Chænesthes *lanceolata*, (sp. nov.) Fruticosa; ramulis cano-vel subferrugineo-floccosis; foliis lanceolatis, acuminatis, supra parce pubescentibus, infra pallidioribus, floccoso-tomentosis, petiolo caniculato, tomentoso; umbellis brevibus, multifloribus; calyce urceolato, 5-dentato, mollissime pubescenti, pilis floccosis; corolla subcurvata, parce puberula lobis marginibus floccosis; antheris lineari-oblongis, subinclusis.—Paramo de Quindui, Nova Granada (Goudot), *v. s. in Herb. Hooker.*

The leaves are 5½ in. long and 1¾ in. broad, on a petiole 1 in. long, with many divergent parallel veins. The stalk of the umbel does not exceed 3 lin., the calyx 3 lin., on a pedicel of 9 lin. long; the corolla seems of a crimson colour, the tube slightly curved, about 1½ in. long and 4 lin. broad; the filaments are adnate to the base of the corolla for the length of 6 lin. where they are tomentous; they then become free, are pubescent below, slender and glabrous upwards, and of a crimson colour; the anthers are half exserted.

Iochroma, *Benth.*

With Sir Wm. Hooker's kind permission I add here a new species of Mr. Bentham's beautiful genus *Iochroma*, in addition to the three species enumerated in the *Bot. Reg.* 1845, *tab.* 20.

4. Iochroma *macrocalyx* (sp. nov.); Suffruticosa; foliis rhomboideo-ovatis, utrinque molliter pubescentibus, subtus pallidis; floribus umbellato-fasciculatis; calyce tubo magno, ventricoso, ore constricto, 5-dentato, 2-lobo, lobo altero 3-dentato; corolla magna, speciosa, cyanæa, hirtella, staminibus inclusis.—Quito, in vallem Lloæ (*Hall*). *v. s. in herb. Hooker.*

This is a very handsome species, with large elliptic leaves, of a somewhat rhomboidal form, broader above the middle, and tapering gradually to the petiole, which is 1 inch long; they are 5½ in. long and 3 in. broad,

elliptic, with comparatively longer petioles, the stamens less exserted, the corolla more slender, with a proportionally longer tube, which is pubescent, the anthers are apiculated, the style far exserted, the peduncles glabrous, longer, and more slender. A specimen in Sir William Hooker's herbarium, from the Island of St. Vincent's is not distinguishable from the Brazilian specimens.*

2. Acnistus *arborescens*, Schlecht. Linn. 7, 67. Atropa arborescens, *Lin. Lam. Dict.* 1. 396. Cestrum cauliflorum, *Jacq. Hort. Schœn.* 3, 41, *tab.* 325.—Arbusculus, ramis pubescentibus, vix tomentosis; foliis oblongis, utrinque attenuatis, breviter petiolatis, integerrimis, supra cano-pubescentibus, demum glabris, infra albo-tomentosis: floribus umbellato-fasciculatis: corolla tubo brevi, lata; staminibus longe exsertis.—In Insulis Antillanis. (*v. s. in herb. Hook. sp. in hort. cult.*)

This species is sufficiently distinct from the others in the form of its flowers, which are well shown in Jacquin's figure, where the leaves are not represented longer than 3 or 4 inches, but in Sir W. Hooker's cultivated specimen they are 9 inches long, upon a petiole of 1 inch, they are $4\frac{3}{4}$ in. broad, quite smooth on both sides; the pedicels are slender, the corolla quite glabrous, very short, and broader in proportion than any other species (4 to 5 lin. in length, 2 lin. in diameter), the

minutely punctulate above, with a few scattered downy hairs on each side; the umbels are sessile in flower, pedunculated in fruit; the calyx is $1\frac{1}{2}$ in. long, 5 lines in diameter in the mouth, and swelling in the middle to 9 lin.; the corolla is long, tubular, and somewhat curved, $2\frac{1}{4}$ to $2\frac{1}{2}$ in. long, of a "dark purple colour," its border is much expanded, its 5 lobes having floccose and ciliato-erose margins, with a broad intervening plicature between each, which is a character common to the other species. Another feature seems to belong to all the species of this genus, the upper surface of the leaves is covered with very minute raised dots.

A representation of this species is given in the Lond. Journ. Bot. Vol. 4. Tab. XIII, XIV, f. 1. Corolla; f. 2. the same laid open; f. 3. Fruit; all nat. size.

* This species is shown in Tab. III. of this work, an explanation of the generic features being given in the description that accompanies it.

calyx is smooth and membranaceous, and the stamens far exserted.

3. Acnistus *Plumieri*. Belladonna frutescens, *Plum. Amer. tab.* 46, *f.* 1. Arbusculus, ramis glabris; foliis longe lanceolatis undulatis, utrinque attenuatis, breviter petiolatis; floribus umbellato-fasciculatis, exalbidis.—Antilles.

This species, hitherto confounded with the preceding, differs in the size and shape of the leaves, and in its flowers. The leaves are from 10 to 12 in. long, and 3 in. broad, upon a petiole 9 lin. in length; the corolla is white, with a much longer and narrower tube; the calyx is deeply cleft into 5 acute lobes.

4. Acnistus *aggregatus*. Lycium aggregatum. *R. & P.*, 2, 45, *tab.* 182, *a.* Cestrum campanulatum, *Lam. Dict.* 1, 688. Lycium arborescens, *Hook. Spreng. Syst.* 1, 701. *Hook. Bot. Misc.* 2, 232.—Frutex leviter tomentosus, canescens; foliis primum fasciculatis, demum sparsis, oblongis, utrinque acutis, undulatis, integerrimis, supra subglabris, subtus incano vel flavido-tomentosis: floribus umbellato-fasciculatis, corolla alba, tubo brevi, lobis macula viridi notatis, staminibus vix exsertis.—Peruvia. *v. s. in herb. Hook.*

The leaves are from 3 to 6 in. long, and $1\frac{1}{4}$ to $2\frac{1}{2}$ in. broad, more elliptic: the calyx and corolla are both pubescent, the lobes of the former being short and obtuse.

5. Acnistus *Guayaquilensis*, G. Don. Lycium Guayaquilense, *H. B. K.* 3, 50:—foliis elliptico-oblongis, acutis, supra parce puberulis, subtus molliter cano-tomentosis; umbellis extra-axillaribus, sessilibus; calyce pentagono; corolla alba; staminibus exsertis.—Guayaquil.

In this species the leaves are described by Kunth to be from 6 to 7 in. long, and $2\frac{1}{2}$ to 3 in. wide, on a petiole $\frac{1}{2}$ in. long; the flowers are about the size of those of *Lycium Europeum*, and of a sweet smell, as in the preceding species.

6. Acnistus *floribundus*, G. Don. Lycium floribundum, *H. B. K.* 3, 51:—foliis oblongis, acutis, glabris, infra pubescentibus; umbellis extra-axillaribus, sessilibus, approximatis; floribus præcedenti majoribus; corolla alba, extus pubescenti;

staminibus exsertis.—In Andibus Peruvianis, ad Caxamarcam.

The leaves of this species are from 2 to 3 in. long, on a petiole of 3 to 4 lin., the flowers somewhat smaller than those of the species last described, are more numerous in each fascicle, of a sweet smell, upon smooth pedicels, which are from 5 to 6 lin. long, and thickening towards the calyx.

7. Acnistus *spathulatus*, G. Don. Lycium spathulatum, *R. & P.* 2, 46, *tab.* 183, *a* :—glaber, ramis angulatis; foliis obovato-spathulatis, dispersis, vel fasciculatis, in petiolum longum decurrentibus; umbellis subaxillaribus sessilibus; corollæ lobis acutis, pubescentibus.—Huanuco Peruviæ. *v. s. in Herb. Hooker.* (*Mathews, n.* 849).

This is described as a shrub, 8 to 10 feet high; the leaves, including the decurrent petiole, are 5 in. long and $1\frac{1}{4}$ in. broad, the pedicels are thicker above; the flowers are of a violet hue, and the filaments pubescent at base.

8. Acnistus *sideroxyloides*, G. Don. Atropa sideroxyloides, *Wild. in R. et Sch.* 4. 686 :—foliis oblongo-ovatis, utrinque acutis, infra pubescentibus; umbellis lateralibus, sessilibus.—Peruvia ad ripas fluv. Magdalenæ.

9. Acnistus *ramiflorus*, (sp. nov.); ramulis pallidis, glabris, verruculosis; foliis oblongis, utrinque attenuatis; nodis annotinis floriferis, valde approximatis; floribus plurimis, umbellato-fasciculatis; pedicellis gracilibus; corolla glabra, lobis margine tomentosis; staminibus styloque 2-lobo exsertis.—In Insula San Vincenti. *v. s. in Herb. Hooker.*

This is a very distinct species, remarkable for its proximate floriferous internodes, which are not more than half an inch apart. The leaves are $8\frac{1}{4}$ in. long, and $3\frac{1}{4}$ in. broad, on a petiole $1\frac{1}{4}$ in. long; the flowers are numerous in each fascicle, the pedicels being 6 to 9 lin. long: the corolla is smooth.

10. Acnistus *Benthami*. Lycium macrophyllum, *Benth.*—Caule argenteo, foliis subfasciculatis, oblongis, utrinque cuneatis, supra glabris, subtus incano-puberulis; floribus in axillis annotinis fasciculatis; corollæ lobis ciliatis; stamini-

bus exsertis.—Mexico. *v. s. in herb. Hooker* (*Hartweg*, *n.* 368).

A species nearly approaching A. *spathulatus* in the size of its leaves, which are 4 in. long, and $1\frac{1}{2}$ in. broad, on a petiole 1 in. long:—the pedicels measure 1 inch.

11. Acnistus *umbellatus*. Lycium umbellatum. *R. & P.* 2, 45, tab. 182, *b*: foliis oblongo-lanceolatis, longe petiolatis, subglabris, subtus pulverulentis; floribus umbellato-fasciculatis, pedicellis flori æqualibus, corolla violacea, lobis acutis, filamentis glabris, inclusis.—Canta Peruviæ. *v. s. in herb. Hooker* (*Mathews*, 1836. Provincia Chachapoyas: 1840. Caxamarca, n. 3244).

The leaves are $3\frac{3}{4}$ in. long, and $1\frac{3}{4}$ in. broad, on a petiole of 9 lin.; the pedicels are $1\frac{1}{2}$ in. long; the corolla has a tube 7 lin. and a border 4 lin. in length.

12. Acnistus *cestroides*. Lycium cestroides. *Schlecht. Linn.* 7, 70: ramulis pubescentibus, interdum spinescentibus; foliis late lanceolatis, utrinque acutis, glabris; floribus umbellato-fasciculatis; pedunculis apice incrassatis; corolla glabra, lobis brevibus, obtusis, margine tomentosis; staminibus inæqualibus, inclusis.—Banda Oriental, in San José de Uruguay. (*Sellow*).

This is said to be a bushy shrub, with flexuose branches, the younger ones downy, short (some of them almost spiny at the apex), bearing fascicles of young leaves, and almost umbellate clusters of flowers; the leaves have short petioles, measuring altogether 2 to $2\frac{1}{2}$ in. long, and 8 to 10 lin. broad, the petiole being semiterete and pulvinate at base, out of a short tubercle; when in flower the peduncles are 3 lines, in fruit 5 lines long; the calyx is $1\frac{1}{2}$ lin. long, having short lobes with a subulate tooth at the apex; the corolla is 8 lin. long; the berry is globose, red, 3 lin. diameter; the seed with its embryo agrees with the character of that given in the typical species.

13. Acnistus *ellipticus*, Hook. fil. ined.—Fruticosus; foliis ellipticis, utrinque attenuatis et glabris, floribus paucis, fasciculatis, pedicellis longis; corolla extus cano-pubescenti,

lobis brevissimis, staminibus inclusis, medio tubi insertis. —Insula Galapagos (*Darwin*).

This is a very distinct species, with smooth elliptic leaves, $3\frac{1}{2}$ in. long, $1\frac{1}{2}$ in. broad, with a channelled petiole $\frac{1}{2}$ in. long; the flowers 3 or 4 in a fascicle, grow out of the cicatrices of the fallen leaves; the peduncle being $1\frac{1}{4}$ in. long, considerably thickened towards the summit; the calyx is about 3 lin. long, with short, unequal, rounded teeth; the corolla is tubular, about 8 lines long.

Species dubia.

14. Acnistus *grandiflorus*. Lycium grandiflorum. *Wild. in R. et Sch.* 4, 689:—foliis ellipticis; calycibus 3-lobis.—Caraccas.

Himeranthus.

The *Jaborosa runcinata* of Jussieu has very properly been separated from the *Jaborosa integrifolia*, Comm. and constituted as a new genus by Prof. Endlicher under the name of *Himeranthus* (Gen. Plant. n. 3860); but as that distinguished botanist probably had no opportunity of seeing the plant in its living state, his character is incomplete in some of its essential features. I therefore propose the following as its true limits, and annex the details of two other species that I met with.

Himeranthus, Endl. (char. reform.)—*Calyx* 5-fidus. *Corolla* hypogyna campanulato-tubulosa, limbo patenti 5-partito, æstivatione plicato. *Stamina* 5 nunc fauci subsessiles, nunc e medio corollæ orta, tubo hinc ad calcem lineolis totidem utrinque pilis divergentibus notato; filamenta brevissima inferne subtenues, apice incrassati in connectivum magnum gibbum producta; antheræ bilobæ, dorso affixæ, longitudinaliter dehiscentes. *Ovarium* 2-loculare, placentis dissepimento adnatis, multi-ovulatis. *Stylus* simplex, apice perforatus. *Stigma* clavatum, sub 2-5-lobum. *Bacca* calyce

PART 4 *Price 7s.*

ILLUSTRATIONS

OF

SOUTH AMERICAN PLANTS.

BY

JOHN MIERS, F.R.S. F.L.S., &c.

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suffulta 2-locularis. *Semina* plurima, reniformia. *Embryo* intra albumen carnosum sub annularis.

Herbæ *Bonarienses, glabræ inferne radicantes, superne sub adscendentes;* foliis *magnis, collo radicali congestis, ovatis, eroso-vel sublyrato-sinuatis, petiolatis;* pedunculis *lateralibus, solitariis, unifloris.*

1. Himeranthus *runcinatus*, Endl. Jaborosa runcinata, *Link.* & *Otto, Ic. Select. tab.* 48, *Hook. Bot. Misc.* 1, 348 :—foliis oblongis, lyrato-sinuatis; pedunculo petiolo vix longiori.—Bonaria.

I found this plant in 1825, at Arecife, 120 miles westward of Buenos Ayres; it seems to correspond with the *Jaborosa runcinata* of Link and Otto; but as Sir Wm. Hooker justly observes, it has no upright stem, as figured by these authors, for the leaves and peduncles proceed at once from the collar at the summit of the root. The plant seems to propagate itself by running suckers which at intervals strike root into the ground, where they form new plants. The leaves vary from 2 to 3 inches in length, and $1\frac{1}{2}$ to 2 in. in breadth; the petioles being about an inch, and the peduncles about $1\frac{1}{2}$ in. long; at times they are somewhat larger. The calyx is subfleshy, with 5 equal, acute, erect, persistent lobes. The corolla is campanular, somewhat contracted in the mouth, the border being 5-partite, with oblong acuminate lobes, and a plicate æstivation; it is of a yellowish white colour, fleshy, quite glabrous outside, and hairy at base within. The stamens have very short filaments inserted below the mouth, expanding into a thick fleshy connective, to which the 2-celled anther, bursting longitudinally, is dorsally attached. The ovarium is green, globular, half immersed in the fleshy torus; the style is simple, white, slightly curved, and is distinctly tubular at the summit to some depth; the stigma is clavate, and indistinctly 2-lobed. I met with no seed sufficiently advanced to show any indication of the embryo, the character of which I have stated on the authority of Endlicher.*

* A drawing of this species is shown in Tab. IV.

From the above description it will be seen that the genus *Himeranthus* is very distinct from the *Jaborosa* of Jussieu, founded originally upon the plant discovered by Commerson, which is the only species known, and which has been very accurately described and figured by Sir Wm. Hooker, (*Bot. Mag. tab*, 3489), from living specimens raised in Glasgow, from seeds sent home by Mr. Tweedie.*

2. Himeranthus *erosus* (n. sp.);—foliis subintegris, vel eroso-sinuatis, carnosulis, petiolatis, petiolo crasso sulcato; pedunculo petiolo 3-plo-longiori; corollæ lobis integris, acutis.—In Provincia Bonariensi.

I found this plant at some considerable distance from Buenos Ayres; the leaves are more than double the length of the former species, comparatively broader, more entire, the petiole being about $2\frac{1}{2}$ in. long, very fleshy, semiterete, with slightly decurrent margins. The peduncles are from 4 to 6 in. long; the flowers are larger, the tube of the corolla not so much contracted in the mouth, and the segments of the border larger in proportion; the filaments are nearly half the length of the tube of the corolla, are fixed about the middle

* I did not find any specimen of Jaborosa during my journey, but judging from the excellent figure above mentioned and the dried specimens I have seen, I subjoin what I consider to be an amended character of this genus.

Jaborosa, Juss.—*Calyx* 5-fidus, *Corolla* hypogyna, tubo longissimo infundibuliformi, limbo plicato, 5-partito, laciniis longis, valde acuminatis *Stamina* 5, corollæ fauci inserta, inclusa, sessilia, filamentis ad tubum corollæ arcte concretis; antheris dorso insertis, connectivo apiculatis, longitudinaliter dehiscentibus. *Ovarium* 2-loculare, placentis dissepimento insertis, multi-ovulatis. *Stylus* simplex longe exsertus. *Stigmata* 5, longe linearia, erecta. *Bacca* calyce suffulta 2-locularis. *Semina* plurima, subreniformia. *Embryo* ignotus.

Herba *Bonariensis subacaulis, prostrata, radicans;* foliis *integerrimis, oblongis, petiolatis;* pedunculis *longis, solitariis*, 1-*floris*.

1. Jaborosa *integrifolia*, Juss. *Lam. Dict.* 3, 189, *tab.* 114. *Hook. Bot. Misc.* 1. 347. *Bot. Mag. tab.* 3489.—Bonaria.

In order to exhibit more strikingly the difference between the two genera I have placed in juxta-position with *Himeranthus erosus* in Tab. v. b. Sir Wm. Hooker's representation of *Jaborosa integrifolia*.

above the villous lines described in the last species; the style is hollow at the apex for one-sixth of its length, and the stigma, with three expanded, obtuse, and almost obsolete lobes, is exserted. Specimens of this plant exist in Sir William Hooker's herbarium, gathered by Dr. Gillies.*

3. Himeranthus *tridentatus* (n. sp.);—foliis ovatis, angulato-sinuatis; pedunculo petiolo 2-plo longiori; corollæ lobis oblongis, obtusis, 3-dentatis.—Bonaria.

This species I found also in the province of Buenos Ayres, in 1826, the only specimen of which was afterwards much destroyed, but I preserved the drawing made on the spot.† The leaves are far more membranaceous and more entire than the former species. The lobes of the corolla are longer, broader, more obtuse, and 3-dentate.

Dorystigma.

Among the plants that I found in my last rapid journey over the lofty chain of the Andes, in 1825, were two species, one of which was also collected about the same time by Doctor Gillies, from whose specimens it was figured and well described by Sir William Hooker in his *Bot. Misc.* 1, 347, *tab.* 71, under the name of *Jaborosa caulescens*. The difference in the stamens and the stigma, the presence of stipular bracts, a somewhat ascending stem, and a far more rigid and dry habit, constitute the ground upon which I propose to separate it from *Jaborosa*, from which genus it differs far more strikingly than *Himeranthus*. The following is offered as its generic character, its name being derived from Δορυ *hasta*, and στγμα on account of its lance-shaped stigma.

Dorystigma, (gen. nov.).—*Calyx* profunde 5-fidus. *Corolla* hypogyna, infundibuliformi-tubulosa, intus hirsuta, limbo plicato, 5-partito. *Stamina* 5, corollæ fauci inserta, inclusa; filamenta breves; antheræ virides, oblongæ, 2-lobæ, late-

* A representation of this species is given in Tab. v. a.

† The above species is also figured in Tab. iv. b.

raliter valde compressæ, incurvæ, apice acuminatæ, longitudinaliter dehiscentes, basi affixæ. *Ovarium* 2-loculare, placentis dissepimento adnatis, multi-ovulatis. *Stylus* simplex, inclusus. *Stigma* magnum, crassum, stylo utrinque adnatum, acutum, lanceolato-obcordiforme. *Bacca* calyce suffulta, 2-locularis. *Semina* plurima reniformia. *Embryo* intra albumen carnosum filiformis, annularis.

Herbæ *Andicolæ, inferne radicantes, prostratæ, vel subadscendentes;* foliis *petiolatis, subternis, lyratis, vel pinnatifido-laciniatis, denticulatis;* pedunculis *extra-axillaribus, solitariis,* 1-*floris, bracteatis.*

1. Dorystigma *caulescens.* Jaborosa caulescens, *Hook. Bot. Misc. loc. cit.*;—caulibus plurimis; foliis suboppositis vel ternis, lyrato-pinnatifidis, spinuloso-dentatis, petiolatis; floribus 3-4 in quaque axilla; pedunculis brevibus; bracteis parvis, subulatis.—In Andibus Chilensium.

Sir William Hooker's above mentioned figure affords so admirable a representation of this plant, and is accompanied by so good a description, that it is needless to make any further remark, than that the bracts are scarcely half an inch long, very slender, and subulately acuminate. Excepting in their relative size, there is little difference in the flower of this and the following species; the mouth and segments of the corolla are densely lined within with tomentum, the hairs being articulated; the anthers have a distinct mucronate apex, and the filaments are somewhat longer.*

2. Dorystigma *squarrosum,* (n. sp.); Jaborosa decurrens (*Nob. Trav. Chile,* 2, 531);—foliis subternis, longe petiolatis, irregulariter pinnatifido-laciniatis, laciniis eroso-denticulatis, petiolo alato, pedunculo duplo longiori; bracteis longissimis, lineari-spathulatis, pedunculo fere æqualibus.—In Andibus Chilensium, altitudine 12,000 ped.

This plant was found by me in January, 1825, in another

* A representation of this plant, with ample sectional details, is given in Tab. VI. A.

and far more elevated portion of the Cordillera, near the summit of the Cumbre; although exposed to the bleak drying winds prevalent in that great altitude, it is larger in its general proportions than the former species, and is remarkable for the great difference in the length of its bracts. The root is fusiform, and from its summit arise several stems, which are somewhat prostrate and ascending. The leaves have a blade about 3 in. long and 1 in. broad at the widest part, quite smooth, light green, opaque, and more coriaceous than fleshy in consistence; the petiole is about 3 in. long, fleshy, round beneath, flat above, with a somewhat broad decurrent ciliated margin; the leaves are generally ternate, and the united bases of the foot-stalks give a knotty form to the axils, which are about $\frac{1}{2}$ in. apart. The number of peduncles and bracts generally correspond with that of the leaves. It may be doubted whether the slender leaflets seen in the axils should be considered as bracts or stipules, neither of which organs are usually met with in the Solanaceous group of plants; but I have adopted the view of Sir Wm. Hooker, who considers them as bracts, which is justified by the circumstance of their being always seen rather within the line of the petioles; they are linear, slender at base, about $1\frac{1}{2}$ in. long, swelling at the extremity into a spathulate blade, with a long cuspidate point. The peduncles are round, rather slender, about $1\frac{1}{2}$ in. long, somewhat erect, 1-flowered. The calyx is persistent, swelling about the torus, somewhat membranaceous above, and divided into 5 equal, long, tapering, erect segments, furnished with long articulate pubescence. The corolla is of a lurid cream-colour below the border, which is white, both externally and within, where it is covered with woolly tomentum; the tube is funnel-shaped, rather more than $\frac{1}{2}$ in. long, the border being divided into 5 rather acute, expanding lobes, which are somewhat plicate at base; the anthers are almost sessile, and fixed by their base below the mouth of the corolla, they are deeply 2-lobed and laterally compressed, so that they stand out in a circular ring around the stigma, they are of a lurid

green, and burst in front somewhat laterally by a longitudinal fissure, throwing out a yellowish-coloured pollen. The ovarium is globular, somewhat flattened at the summit, and divided into 2, 3, or 5 indistinct lobes. The style is erect, cylindrical, somewhat enlarging at its extremity. The stigma is oblong, cordate at base, tapering, obtuse at apex, formed of 2 indistinct flattened adnate lobes, fleshy, green, and shining. The berry is cernuous, fleshy, and 2-celled; the seeds are flattened, reniform, subrhomboidal, with a marginal hilum; the testa is somewhat fleshy and rugous; the embryo is slender, filiform, almost annular, and imbedded in fleshy albumen; the radicle, which points toward the hilum, is very long, straight at the extremity, and bent above; the cotyledons are short, slender, semiterete, curved, and terminate near the extremity of the radicle.*

TRECHONÆTES.

Among the few interesting plants gathered in my journey over the Cordillera in the January, 1825, was one found upon the eastern descent of the Cumbre, towards Las Cuevas, at an altitude of 11,500 feet, in a very dry and arid situation, which circumstance suggested the above generic name, from τρηχῶ *locus asper*, ναέτης *incola*. Specimens of the same plant have lately been sent to this country by Mr. Bridges; and as it has not been yet described, I now offer the result of my long recorded observations, from which it will be seen to possess characters very distinct from *Jaborosa* and its congeners.

TRECHONÆTES, (gen. nov.).—*Calyx* 5-partitus. *Corolla* hypogyna, late campanulata, limbo plicato, 5-partito, laciniis latis, acutis. *Stamina* omnino libera, inclusa; filamenta longa, filiformia, imo tubi adnata; antheræ connectivo nullo, dorso affixæ, 2-lobæ, rotundatæ, basi divaricatæ, longitudinaliter dehiscentes. *Ovarium* rotundum, toro carnoso ortum, 2-loculare, placentis dissepimento adnatis, multi-ovulatis.

* A figure of this species, with full details, is given in Tab. VI. B.

Stylus filiformis, subexsertus, apice incrassatus. *Stigma* capitatum, lamellis 2 magnis, reflexis, corrugatis, adnatis. *Bacca* ignota.

Herbæ *Andicolæ*, *pubescentes*, *inferne radicantes;* caulibus *plurimis*, *prostratis*, *vix adscendentibus* ; foliis *pinnatifido-laciniatis*, *dentatis* ; pedunculis *extra-axillaribus*, *folio multo brevioribus* ; floribus *solitariis*, *vel fasciculatis* ; bracteis *linearibus*.

1. Trechonætes *laciniata*. Jaborosa laciniata (*Olim. Nob. Trav. Chile*, 2, 531);—caulibus plurimis, brevibus, subadscendentibus ; foliis subcoriaceis, pinnatifido-laciniatis, lobis dentatis acutis ; floribus subsolitariis ; pedunculis extra-axillaribus, bractea brevi tenui subulata apice lanata instructis.—In Andibus altissimis Chilensibus.

This curious plant is evidently allied to the *Jaborosa* group of *Solaneæ*, but it has an aspect very different from the others, both in its general pubescence and more lurid hue, as well as by its broad, duller, campanular flowers, with stamens quite free and inserted in the base of the corolla. The stem is fusiform, extending horizontally in the stony soil, from which radiate several half prostrate branching stems, whose axils are distinct although approximate; the leaves are sometimes alternate, sometimes subopposite; the petiole is fleshy, round below, flattened or caniculate above, with broad decurrent margins, and about 2 in. long ; the blade is about 2 or $2\frac{1}{2}$ in. long, and $1\frac{1}{2}$ in. broad at the extreme points ; they are deeply and somewhat pinnately laciniate, the segments being rather narrow, somewhat parallel and roundish, the margin being sometimes entire, with a cuspidate apex, but more generally sharply toothed with intervening sinuosities; they are somewhat erect, covered with long soft pubescence, the hairs being composed of several broad articulations ; the peduncles are about half the length of the petioles, and round ; the calyx is divided into five rather acute segments, very pubescent outside, glabrous within ; the corolla is broadly campanulate, the tube being slightly pubescent on both sides ; the lobes are ovate, acute, terminated at the apex by a somewhat terete woolly spur, the

margins being whitish, membranaceous, the more central portion as well as the tube being marked with numerous purplish brown reticulations, and a few scattered hairs; the filaments are slender, nearly the length of the tube of the corolla, quite free to the base, whence they originate from a small adnate ring; they are smooth and slightly pubescent at base, erect, and curving downward toward the apex; the anthers, which are thus inverted, consist of two nearly globular adnate lobes, divaricate at base, bursting longitudinally by lateral fissures; they are without any sensible connective, and are fixed dorsally near the base, on the apex of the filament. The ovarium is round, pubescent, and partially imbedded in the fleshy torus, is 2-celled, with many ovules, adnate to a central enlargement of the dissepiment; the stigma is clavate, consisting of 2 adnate corrugated lobes. At the time I collected this plant, there was no indication of fruit, nor is any seen in Mr. Bridges's specimens, but from analogy it may be assumed to be a berry.*

2. Trechonætes *sativa* (n. sp.);—caulibus plurimis, confertis, subadscendentibus, pubescentibus; foliis ternis, inæqualibus, oblongis, angulato-sinuatis, vel pinnatifido-laciniatis, laciniis angulato-sinuatis, lobis mucrone glanduloso apiculatis, utrinque parce pilosulis; floribus plurimis, pedunculatis, aggregatis, pubescentibus, bracteis totidem spathulatis, integris, subglabris.—In Andibus Provinciæ Tucumanensis. *v. s. in herb. Hooker, a Tweedio lecta,* n. 1253.

This plant, according to Tweedie, is cultivated in Tucuman, where it is "used as mustard," from which it may be inferred that the seeds have a pungent taste, for no part of the dried plant exhibits any such flavour. It grows in broad patches about a foot high; the stems are covered with soft hairs, and the axils are about 3 in. apart; the leaves, 3 in each axil, are of unequal size, the largest being 7 in. long, including the rather short decurrent petiole, and 4 in. wide; these are pinnately laciniate; the smaller ones are about 4 in. long and

* A representation of this species is given in Tab. VII.

2½ in. broad, and are angularly sinuate. Numerous flowers are crowded together in a fascicle on one side of each axil, the peduncles being 9 lin. long, with a glabrous, spathulate bract, at the base of each, from 2 to 9 lin. long. The calyx is deeply cleft into 5 acuminate, subulate, membranaceous, green segments, pilose, 2 lin. long. The corolla is of a dusky green, less than half the size of that of the former species, sparsely covered with long, soft pubescence, broadly campanulate, submembranaceous, veined, and deeply divided into 5 ovate, acute lobes, with undulated margins, and terminated by a woolly rostrate apex; the stamens are included; the filaments, entirely free, slender, glabrous, erect, and recurved at the summit, arise from the points of a slender, adnate, 5-toothed ring in the base of the corolla; the anthers are ovate, cordate, 2-lobed. The ovarium is round and smooth; the style short and thick; the stigma clavate, broad, and 2-lobed.

Pionandra.

Under this name I propose to found a genus comprising some Solanaceous small trees and arborescent shrubs with wide spreading branches, and long racemes of flowers similar to three species that I found in the Organ Mountains in 1829 and 1838. The *Witheringia diploconos*,* figured by Von Martius in his Nov. Gen. et Sp. vol. III. p. 76, tab. 229, evidently belongs to this genus, the characters of which may be thus defined.

* The genus *Witheringia*, according to the latest arrangement in the Repert. Bot. of Walpers, 3.29, contains many (24) heterogeneous species, and it appears to me that very few of those enumerated, harmonize with the generic character as established by L'Heritier. In the herbarium of Sir William Hooker, I can find no plant corresponding with the typical species; and in the British Museum where L'Heritier's original specimens are deposited, there are two plants marked *Witheringia solanacea*, both different, and neither answering to the figure and description of the founder of the genus. In the absence, therefore, of the typical plant, without any good description of it, or any satisfactory drawing of its details, without even the knowledge of the country where the original was obtained, nor by whom collected, it is difficult to understand the true limits of the genus.

PIONANDRA (gen. nov.) *Calyx* parvus, 5-partitus, persistens. *Corolla* hypogyna, tubo brevissimo, limbo amplo, 5-partito, lobis 5 subcarnosis basi inflatis vel lanceolatis tenuioribus, æstivatione marginibus (fere valvatis) introflexis, interdum mucroni lineari rostratis. *Stamina* 5, æqualia, circa stylum conniventes ; *filamenta* breves, erecta, ex annulo plus minusve carnoso tubo adnato orta, crassa, lata, sæpissime utrinque auriculata, nunc figura sigmoidea recurvata, nunc rectiora, in connectivum magnum carnosum frequenter incurvum continua ; *antheræ* 2-loculares, dorso adnatæ, lobis oblongis, longitudinaliter dehiscentibus, apice cervice gibbo, utrinque poro hiante, jugatæ. *Ovarium* superum, obovato-oblongum, cum stylo articulatum, 2-loculare, placentis lunulatis, utrinque seminiferis, septo adnatis, multiovulatis. *Stylus* nunc brevis, crassus, turbinato-infundibuliformis, apice cavus, nunc gracilior, longus, subfusiformis, apice incrassatus. *Stigma* sub—2-labiatum, intus glandulis 2 instructum. *Bacca* magna, pulposa, 2-locularis. *Semina* numerosa, structura ignota.

Frutices, vel arbusculæ, *in America meridionali intertropica indigenæ, suborgyales, ramosissimi,* ramis *dichotomis,* foliis *petiolatis geminis, subintegris plerique cordatis, altero minori ;* racemis *extra-axillaribus sæpissimè in dichotomia ramulorum* ; floribus *pedicellatis, secundis,* pedicellis *articulatis, sæpe deciduis.*

Derivatio ex πιων *pinguis,* ανηρ *stamen,* propter antherarum connectivum magnum.

I propose to separate the different species into two sections, with curved and straight stamens.

§ I. CERATOSTEMON. *Stamina valde curvata, crassa, apice conniventes.*

1. Pionandra *floribunda* (n. sp.) :—foliis 5-nerviis, fere glabris, cordato-ovatis, apice valde attenuatis, et ciliato-serratis, limbo integro, supra nitidis, creberrime punctulatis, subtus glauco-pallidis, sub lente minutissime pubescentibus ; racemis secundis, folio æqualibus, corollæ lobis extus apice rostratis. Serrâ Organensi, Rio-Janeiro.

This is a small tree with very bushy widely spreading branches, conspicuous for the number of its long pendent racemes of flowers, that I met with on the ascent of the Organ Mountains, at an elevation of nearly 3000 feet. The branches are flexuose, somewhat dichotomous, quite smooth and glabrous. The leaves are sharply acuminate at the apex, where they are subserrulated and ciliate; the margin is very entire and somewhat membranous; they are about 4½ inches long, exclusive of the petiole, and 2½ inches broad, the twin leaf being about an inch shorter: they are quite smooth and shining above, their surface being covered with very numerous, minute, raised points, which are somewhat pellucid when viewed through the light; below they are quite smooth, of a pale glaucous green, apparently glabrous, but when examined by a lens, are seen covered with a very fine pubescence; they are somewhat 5-nerved at base, the midrib and nerves being slender and prominent. The petiole is channelled above, slightly pubescent, and 1½ inch long. The racemes of flowers, about 3 inches long, generally spring from the stem on one side a little above the origin of the pair of leaves, and sometimes out of the bifurcation of the branches; the pedicels all arising from one side of the peduncle, are alternately arranged in two rows, and articulated at a little distance from their origin, where the greater number fall off: they are about an inch long and glabrous. The calyx is small and fleshy, and does not increase in size with the fruit, its segments being acute and slightly pubescent. The corolla is of a lurid greenish white, fleshy, and about an inch in diameter, when fully expanded; it has a short campanular tube, which is distinctly saccate and obtusely 5-angular at the corners opposite the stamens; the border is cleft into 5 equal, ovate, acute segments, having very woolly and slightly inflected margins, which in the bud present an induplicate œstivation nearly valvate, each segment has externally at its apex, a long terete spurlike woolly process; when the flower is fully open, the lobes are quite patent: the corolla outside is quite glabrous, but it is lined within with a short woolly white

tomentum, and near the base of the tube, is seen a semi-terete fleshy annular staminiferous ring. The stamens are very large and conspicuous, quite glabrous, and alternate with the lobes of the corolla; the filaments are united at their base into a very short tube, which springs from the annular ring alluded to; they are dilated and fleshy, quickly expanding beneath the anthers into 2 prominent auricular lobes, and terminate in a remarkably large fleshy gibbous connective supporting the adnate anthers, which consist of 2 distinct and separate lobes, somewhat divaricate at base, and united at their summit by a cervix, forming a bottle-necked apex, in which two distinct pores are seen: the lobes, however, present a decided longitudinal dehiscence by a central furrow; the summits of the anthers all converge round the style. The ovarium is oval, quite smooth, 2-celled, with a broadly lunulate placenta arising from each side of the dissepiment, around which numerous ovules are closely arranged. The style is short, thick, scarcely longer than the ovarium, it is hollow and tubular more than half way down. The stigma is a cyathiform fleshy cup, obsoletely 2-lobed, terminating the style, having within its mouth 2 fleshy glands. The berry grows to a large size; the largest that I saw of a kindred species which was far from mature, was oblong, and nearly 2 inches in length, in which the seeds were not ripe enough for examination.*

2. Pionandra *pubescens* (n. sp.)—Arbuscula, tota pubescens foliis 5-nerviis, obovatis, basi obtusis, vix cordatis, apice attenuatis integris, utrinque pubescentibus; racemis secundis, folio brevioribus.—Rio de Janeiro, Serra Organensi.

A species much resembling the former; but altogether closely pubescent, and of pallid appearance. The leaves are more obtuse than cordate at the base, the flowers are smaller, not quite so fleshy, but the stamens are hardly so much curved. The fruit was, in a very young state, $1\frac{1}{4}$ inch long

* A representation of this species with full details is shown in Tab. VIII.

and half an inch in diameter, but without doubt it grows to a much larger size.

3. Pionandra *ciliata* (n. sp.):—pubescens; foliis geminis, altero minori, lanceolatis, utrinque attenuatis, vel basi obtusioribus, sæpe inæquilateris, apice caudato-acuminatis margine denticulatis, dense piloso-ciliatis, supra sparse pilosis, subtus tomentoso-pubescentibus, pilis articulatis: racemis secundis, folio brevioribus: bacca magna.—Rio de Janeiro, Serrâ Organensi.

This species is very distinct from the two former, and approaches more in the form and size of its leaves to the *Solanum capsicoides*, Mart. which also belongs to this genus. I did not find it in flower, but from the resemblance of its habit to those above described, I imagine it will be found to belong to this section. The berry, though far from mature, measures nearly $1\frac{1}{2}$ in length and $\frac{3}{4}$ inch in diameter.

4. Pionandra *fragrans*. Solanum fragrans *Hook. Bot. Mag. tab.* 3684.—Arborescens: foliis geminis, 5-nerviis, inæqualibus, ovatis, majori basi sub-elliptico, altero cordato, integerrimis, glaberrimis, supra lucidis, albo-punctulatis, infrà argenteis, marginibus paulo incrassatis: racemi floribus secundis, pedicellis inferioribus maxime elongatis: corolla late campanulata, profunde 5-partita, staminibus geniculatis, stigmate dilatato, concavo—Guiana. *v. s. in. herb. Hooker.*

From Sir Wm. Hooker's excellent figure of this species, it will be seen how closely it approaches *P. floribunda* in its general habit, and in the size of its leaves, one of which only is here cordate. The racemes are 4 inches long, arising from the forks of the dichotomous branchlets, the pedicels are unequal in length and articulate: the calyx is somewhat pentagonous, with triangular lobes and ciliate margins: the segments of the corolla are lanceolate as in *P. capsicoides*.

5. Pionandra *diploconos*. Witheringia diploconos *Mart. Gen. et spec.* 3.77, *tab.* 229:—fruticosa, glabra: foliis sub 5-nerviis, ovatis, acuminatis, basi subcordatis, integris, utrinque glabris; racemis alaribus, folio longioribus.—Rio Janeiro et Tejuca.

It is only from the description of Dr. von Martius that I am acquainted with this species which certainly approaches close to my *P. floribunda:* the leaves, however, are entirely glabrous, and not punctulate; they are little more than half their size, and less cordate at base than in that species. The raceme is much longer than the leaf. The calyx is denticulated, the stamens are ventricose, but the fleshy connective is less curved: the filaments are expanded below, but are not auriculate: it has the fleshy perigynous ring, and the annular disc, as well as the short tubular broad style and stigma of *P. floribunda.* Its flowers are odorous, which I do not remember to have noticed in the Organ Mountain species, and the lobes of the corolla want the rostrate apical appendage so conspicuous in that species.

6. Pionandra *Gardneri* (n. sp.)—fruticosa: foliis geminis, altero minori, sub 5-nerviis, cordato-ovatis, valde acuminatis, utrinque pilis longis mollibus articulatis, infraque pallide tomentosis, margine ciliatis et eroso-denticulatis: racemis è bifurcatione secundis, folio multo longioribus.—San Caetano, Prov. Minar. General. Braziliæ.—*Gardner, No.* 5041.

A very distinct species remarkable for the length of its articulate glandular hairs. It forms a shrub about 4 feet high: its larger leaves are $3\frac{1}{4}$ in. long and 2 in. broad on a petiole $1\frac{1}{4}$ in. in length, the smaller leaves are $2\frac{3}{4}$ in. long and $1\frac{3}{4}$ in. broad on a petiole $\frac{3}{4}$ in. The raceme is 7 in. long: the calyx is 5-angled with broadish deep segments, very pubescent, and somewhat membranaceous: the corolla is very pubescent outside, smooth within, its segments being broad and acute: the stamens and pistillum resemble those of *P floribunda.*

7. Pionandra *betacea.* Solanum betaceum *Cav.* 6.599, *tab* 521:—fruticosa: ramis cauleque succulentis: foliis magnis, ovatis, acuminatis, cordatis, baseos rotundatis, incumbentibus, 5-nerviis, utrinque molliter pubescentibus, marginibus undulatis, ciliatis, infra purpurascente-ferrugineis racemo e bifurcatione pendulo, folio breviori; floribus secundis.—Nova Hispania. *v. s. in Herb. Hooker, e*

plurimis locis relata, nempe-Nova Granada, *Goudot*. Lima, *in hort. cult. Mc. Lean*, Buenos Ayres, *in hort. cult. Tweedie*, *&c.*

According to Cavanilles this is a shrub about 4 feet in height. In all the specimens I have seen, the larger leaves measure 9 or 10 in. in length, 5 in. in breadth on a petiole, $1\frac{1}{2}$ in. long: the smaller leaves are $5\frac{1}{2}$ in. long and 4 in. broad on a petiole of $1\frac{1}{2}$ in.: the racemes are about 7 in. in length: the corolla of a rosy hue has a short tube, with 5 oblong segments reflected at tip: the 5 equal stamens are included, the filaments are short and thick, the auricular lobes though small and hidden by the anthers are distinct and free: the anthers are large, curved, and approximate: the berry is reddish, about the size of a pigeon's egg, and 2-celled: this is doubtless the same fruit that I saw in the markets of Lima, where it is commonly used for cooking in lieu of the ordinary Tomate, the flavour of which it greatly resembles. Tweedie remarks that it is used in Buenos Ayres for the same purpose, but not ordinarily, for I never observed it.

8. Pionandra *pendula*. Solanum pendulum, *R. et P. Flor. Peruv.* 2.39, *tab.* 174, *non Link*:—fruticosa: foliis alternis, obovatis, simplicibus, vel geminis, aut pinnatis, utrinque pubescentibus, integerrimis, venosissimis, foliolis 2—6 nis, oblique cordatis, acutissimis, impari majori: racemis dependentibus, furcatis, pedicellis articulatis, sæpe deciduis: fructu magno pyriformi—Peruvia in Muña.

From the figure of Ruiz and Pavon, I do not doubt this species belongs to this genus; and although the leaves are sometimes pinnate, they are often simple and cordate: the racemes, as in the other species, generally grow out of the bifurcation of the branchlets, and have many fleshy, secund flowers, with articulated pedicels: the fruit is also large, 2-celled, with lunulated placentations.

9. Pionandra *obliqua*. Solanum obliquum *R. et P. Fl. Per.* 2.35, *tab.* 165, *a*:—glabra: foliis simplicibus, sub 5-nerviis, obovatis, oblique cordatis, acutis, supra nitidis, leviter pubescentibus: racemis extra-axillaribus, recurvis,

floribus duplici serie secundis, pedicellis articulatis, inferioribus maxime longioribus—Peruvia ad Chinchao.

There can be no doubt from the figure and description above cited, that this species possess all the essential characters of *Pionandra*.

10. Pionandra *viridiflora*. Solanum viridiflorum *R. et P. Fl. Per.* 2.38, *tab.* 173, *b* :—fruticosa, villosa, caule tereti : foliis geminatis, altero minori, sub 5-nerviis, ovatis, acutis, rotundato-cordatis, baseos lateribus incumbentibus, utrinque pilosis, pilis flavis, articulatis, infra pallidioribus ; racemo e bifurcatione, folio breviori, floribus secundis, pedicellis articulatis : fructo magno, ovali—Peruvia (*v. s. in herb. Hooker alabastris nondum maturis.*)

A species closely allied to *P. pendula*, and very near *P. betacea*, but with much smaller leaves : the larger ones measure 7 inches in length, and are $5\frac{1}{2}$ in. broad, on a petiole $1\frac{1}{2}$ in. : the smaller being $4\frac{1}{2}$ in. long, and $3\frac{1}{4}$ in. broad, on a petiole of the same length of the basal lobes 1 in. long : the calyx is pubescent, 5-angular, and somewhat campanulate, with 5 short lobes : the corolla is tomentous outside, with woolly margins : the stamens are somewhat long, with a thickened fleshy, somewhat scabrid connective : the style is considerably swollen in the middle, and the stigma cup-shaped : the berry is of the size of that of *P. betacea*.

11. Pionandra *premnæfolia*. Solanum premnæfolium. *Dun. mss* :—tota pubescens : fruticosa, foliis geminis, altero minori, 5-nerviis, cordato-ovatis : racemis folio multo longioribus, pedicellis articulatis, deciduis.—Brazilia in Bahiam (*a Luccombe*) et Prov. San. Pauli (*a Bowie et Cunningham lecta*) *v. s. in Herb. Mus. Brit.*

In habit this species much resembles *P. floribunda* ; but the leaves and stems are covered with long close hairs : the larger leaves are $3\frac{1}{4}$ to 4 in. long, and $2\frac{1}{2}$ to $2\frac{3}{4}$ in. broad, on a petiole 1 in. to $1\frac{1}{2}$ in. long : the smaller leaves measure $2\frac{3}{4}$, by 2 in. on a petiole 1 in. long : the raceme is $4\frac{1}{2}$ in. long : it probably belongs to this section.

§ 2. Euthystemon. *Stamina rectiora.*

12. Pionandra *capsicoides.* Solanum capsicoides *Mart. Flora* (*BZ*) 21. *Biebl.* 1.78:—suffruticosa; ramulis pubescentibus; foliis ovato-lanceolatis, lanceolatisve, acuminatis, interdum geminis, minori obovato, basi obtuso, majoribus acutiusculis, vel obtusis, inæquilateribus, subtus pubescenti-mollibus, supra pilis articulatis sparse adspersis, pedunculis filiformibus, fructiferis deflexis.—Brasilia, Prov. Rio de Janeiro et Min. Geraes.

I have this species from Cape Frio and Villa Ricca in the province of Minas Geraes. Its leaves are nearly 6 inches long and 2 inches broad; the racemes are pubescent and about as long as the leaf, with secund flowers, the pedicels being articulated a little above their base. The calyx is pubescent; but the corolla is glabrous, and of much more membranaceous structure than any of the former species with lanceolate segments: the stamens are more slender, nearly straight; the filaments are united upon a somewhat membranous perigynous ring, and although not fleshy, are dilated and expanded in a bilobed form below the anthers: the connective is thin, flat, tapering above; the anther cells are turgid, burst longitudinally, and as in *P. floribunda* are constricted near the summit by a collar, which is surmounted by an emarginate globular apex, that opens by two distinct pores. The ovarium is smaller, and together with the style and stigma, is quite glabrous: the style is rather slender, thickening toward the summit, and is as long as the stamens; the stigma, though much smaller, resembles that of the before-mentioned species.*

13. Pionandra *divaricata.* Witheringia divaricata *Mart. Nov. Gen. et Sp.* 3.75, *tab.* 228:—suffruticosa, tota subtiliter pubescens: foliis ovato-lanceolatis ovatisve, acuminatis, basi subrotundatis, racemis e bifurcatione alaribus, sim-

* A figure of this species with details is given in Tab. IX.

plicibus, paucifloris, folio superantibus.—Serra do Mar, Braziliæ.

This species very closely resembles the last, but its leaves are not more than 4 inches long, and 1 inch broad, generally much smaller, pubescent on both sides, and nearly equilateral; the lobes of the calyx are ciliate, often serrulate; the filaments are dilated, and membranaceous below, expanding above in a large inflated connective; the anther cells are straight, sub 4-gonous, ventricose and turgid, of a yellow colour; the style is longer than the stamens, and with the stigma intermediate between that of the last species and of *P. floribunda*. It approaches *P. ciliata*, but the leaves are smaller, broader in proportion, not so much attenuated at the apex, and less pubescent. The racemes are shorter, 2 to 6 inches long, with 4—6 to 10 flowers, which have the articulation of the pedicels close to the peduncle, so that when they fall off, the stem scarcely exhibits the persistent bases of the stalks observed in the other species.

14. Pionandra *Tegore*. Solanum Tegore *Aubl.* 212. tab. 84;—frutescens, villosa: foliis inferioribus amplissimis, sinuato-pinnatifidis superioribus ovatis, cordatis, acutis; racemis secundis, e bifurcatione alaribus.—Guiana. *v. s. in Herb. Mus. Brit. et Herb. Hooker.*

The upper leaves are about the size of those of *P. pubescens*, and in like manner, as well as the stems and peduncle, are covered with articulate hairs; they are also geminate, unequal, and sub 5-nerved. The racemes are very short, and secund, growing out of the bifurcation of the branches; the pedicels are also articulated, and deciduous, characters quite in conformity with all the species above enumerated. Aublet describes and figures the fleshy ring at the base of the tube of the corolla, out of which the stamens originate, which he states to be long, straight, and approximate at the apex; the corolla is deeply 5-partite; the fruit is a spherical berry, about the size of a cherry. A remarkable character is observable in this plant, in the very large size of the lower leaves, which are about 1 foot in length, and 8 inches broad,

divided into acute lobes, by several deep incisures, sinuate at base; they are nearly glabrous. I did not observe this remarkable dissimilarity in the size of the upper and lower leaves in any of the species I found in the Organ Mountains, nor has this been noticed by the authors who have described the other species, if we except *P. pendula* where some of the leaves are simple and cordate at the base, while others are larger, and divided into 3 or 5 segments, as shown in the figure of Ruiz and Pavon above quoted.

15. Pionandra *Hartwegii* (n. sp.);—fruticosa: foliis geminis, altero minori, 5-nerviis, cordato ovatis, integris, superne lucidis, parce pilosis, infra ferrugineo-pruinoso-punctatis; racemis e bifurcatione subscorpioideis, folio multo longioribus.—Columbia (*Hartweg, n.* 1297) *v. s. in herb. Hooker.*

Stems round, dark brown, subpubescent: leaves $4\frac{1}{2}$ in. long, $2\frac{3}{4}$ in. broad, on a petiole $1\frac{3}{4}$ in. length, the smaller one $2\frac{3}{4}$ in. long, $1\frac{3}{4}$ in. broad, on a petiole 1 in. long; raceme pubescent, $8\frac{1}{2}$ in. long; pedicels articulated, $1\frac{1}{4}$ to $1\frac{1}{2}$ in. long; calyx small, 5-gonous, glabrous, lobes short, obtuse, with a very small tooth in the apex; corolla with linear, lanceolate segments, an inch long, obtuse at the apex, smooth with floccose margins; anthers 2-celled, very long, equal, linear, erect, somewhat scabrous, opening by an apical pore, and by a lateral fissure in each cell: style obtuse; stigma clavate.

16. Pionandra *coriacea*, (n. sp.):—fruticosa, foliis geminis, magnis, glabris, valde coriaceis, cordato-ovatis, 5-nerviis, altero minori, supra punctulatis, infra pruinosis: racemis brevibus, scorpioideis; floribus secundis, pedicellis articulatis, approximatis; corolla tubo brevi, laciniis lanceolatis: antheris linearibus, erectis, connectivo crasso.—Peruvia (*Mathews*, 1971) *v. s. in herb. Hooker.*

The leaves of this species are remarkably thick, opaque and coriaceous, about 8 inches long, 5 in. wide, with a petiole 2 in. long, the smaller ones 5 inches long, and $3\frac{1}{2}$ in. wide, the petiole being the same length as the basal lobes.

17. Pionandra *Cajanumensis*. Solanum Cajanumense, *H. B. K.* 3.47:—fruticosa, ramulis hirsutis: foliis solitariis, subro-

tundo-ovatis, breviter acuminatis, cordatis, integerrimis, hirsuto-pilosis; racemis supra-axillaribus, trifidis, floribus unilateralibus.—Nova Granada.

The leaves are described as 7 inches long, 5½ inches wide. The stamens included, the filaments short and much dilated, the anthers opening by pores, according to Kunth, and by lateral fissures, according to Bonpland. The berry is 2 inches in length.

Species Dubiæ.

18. Pionandra *crotonifolia*. Solanum crotonifolium, *H. B. K.* 3.30 *Dun. Syn.* 18:—fruticosa: foliis geminis, oblongis, angusto-acuminatis, basi rotundatis et inæqualibus, subrepandis, supra canescenti-pubescentibus, subtus molliter albo-tomentosis: racemis supra-axillaribus, sæpe bifidis, floribus unilateralibus.—Nova Granada.

The leaves are 4-5 inches long, 1½ to 2 inches broad, with stellate pubescence; the racemes are short, sometimes bifid, and the flowers have articulated pedicels.

19. Pionandra *Narensis*. Solanum Narense, *H. B. K.* 3.31. *Dun. Syn.* 18:—fruticosa, ramis tomentosis, foliis geminis, altero minori, ovatis, acutis, basi cordatis et inæqualibus, supra canescenti—subtus albido—tomentosis, mollibus: inferioribus sinuato-angulatis; racemis lateralibus, bifidis; floribus unilateralibus.—Nova Granada.

The upper leaves are 5-6 inches long, 2½-3 inches broad; the lower ones 7-8 inches long, and 5-6 inches broad; all with stellate pubescence.

20. Pionandra *trachyphylla*. Solanum trachyphyllum, *H. B. K.* 3.31. *Dun. Syn.* 18:—fruticosa; ramis tomentosis, foliis geminis, altero-minori, oblongis, acuminatis, basi rotundatis, inæqualibus, integerrimis, supra scabriusculis, subtus mollissimis, cano-tomentosis, racemis lateralibus, dichotomis, floribus unilateralibus.—Popayan.

The leaves are 5-6 inches long, and 2¼ to 2½ inches broad, with stellate pubescence.

21. Pionandra *flagrans*. Solanum flagrans. *Tenore, Ann. Sc. Nat.* 13.381 ,—arborescens: foliis geminis utrinque glabris, oblongo-lanceolatis, acutis, integerrimis, racemis secundifloris, extra-foliaceis, pedunculis incrassatis.—Brasilia.

It is probable that under a careful revision of the extensive Linnæan genus *Solanum*, which is greatly required, many other species will be found to come within the limits of *Pionandra*. It is with much doubt I have placed here the last four species which are only known from the short descriptions quoted; when examined with more attention they may probably be found to belong to another group, many species of which I have observed in the splendid herbarium of Sir Wm. Hooker; I allude to such as approach *S. conicum R. & P. Flor. Peruv. tab.* 172, *b.* Many of these have simple, others pinnate leaves, sometimes smooth, often with stellate tomentum; they have racemes either simple or scorpioid, often dichotomously branched, either extra-axillary or growing out of the bifurcation of the branches, they have very long narrow coriaceous anthers, and a peculiar form of style; a section of this same group, numerous in species, have their stems and petioles aculeate, such as *S. torvum loc. supra cit. tab.* 175 *a. S. lanatum, tab.* 174 *b, S. incarceratum, tab.* 176. The present arrangement of the genus *Solanum* comprising upwards of 500 species, is certainly very defective, the form of the leaves, offering very unsatisfactory, and uncertain characters on which to found any subdivisions; far better elements will be found to exist in the floral characters assisted by the particular habit of the several species; much therefore may be expected from the distinguished author of the well-known monograph on *Solanum*, who has undertaken the arrangement of the nat. ord. Solanaceæ, for the forthcoming volume of the Prodromus of De Candolle.

Sorema.

The following details of *Nolana paradoxa, Lindl.*, were made as far back as 1823, and notwithstanding several species of *Nolana* have already been figured at different

times, I am not aware that the carpological characters of the order *Nolanaceæ* have hitherto been illustrated. The plant in question, which I found near the sea-shore at Concon, the place of my residence in Chile, is now called by Dr. Lindley, *Sorema paradoxa*, in a very interesting paper which he has given on the divisions of this order in the *Botanical Register for Sept.* 1844, *tab.* 46. Although much additional knowledge has thus been afforded, the real limits of *Nolanaceæ* are not yet fully defined, and the true place of its arrangement in the Natural system not yet quite agreed on. Dr. Lindley, in the last edition of his "*Natural System*," p. 229, places it near *Convolvulaceæ*, with which it accords in its expanded funnel-shaped plicated corolla. Others have combined it with *Borragineæ*, with which it agrees in having a plicated corolla, included stamens, and distinct nuts. Prof. Endlicher, in his *Genera Plantarum*, p. 655, following nearly the views of Dr. Lindley, places it as a sub-order, or rather as an aberrant group "*Convolvulaceis affinia*." After a careful examination of its relations, I venture to suggest for it a distinct place in the system, at the beginning of the class *Tubulifloræ* of Endl., immediately following the *Borragineæ*, in the *Nuculiferæ* of that eminent Botanist, so that intermediate with *Convolvulaceæ*, the *Nolanaceæ* will thus retain their close affinity towards *Solanaceæ*, for it is especially with *Petunia*, &c., that they agree in their convoluted and deeply plicated corolla with unequal included stamens, and not less with many others among *Solaneæ* in their geminate or fasciculate leaves and general habit; and while they also accord in the annular filiform shape of their embryo, enveloped in albumen, and in the position of the radicle, they differ from the whole of that order in the origin and development of their distinct carpels, for the ovules of *Solanaceæ* are invariably attached to the dissepiment of a 2-celled or imperfectly 4-celled ovarium. With *Borragineæ*, on the other hand, they agree in the gynobasic insertion of their distinct ovaria upon a fleshy lobed disc, and in their separate nuts, with a single seed in each cell, perforated at the base, but whether the areolar

process, which I have shown to exist in all the *Nolanaceæ*, possesses any direct resemblance, in its nature and origin, to the salient "strophiole (*Cælomphala*, Schrad.)" that is seen attached to the perforated nuts of many Borrageæ, according to the descriptions of the late Prof. Spenner (*Nees Gen. Plant, tom.* 2, *tab.* 69—73), it is not now necessary to determine, it being sufficient for our present purpose to indicate the fact, and to add that they differ from the whole of that family, in the form and position of their embryo, as well as in habit and inflorescence. With *Convolvulaceæ*, as Prof. Lindley remarks, many analogies exist, but they differ in their simple, not imbricate calyx, in their distinct ovaria and the important character of their embryo. I shall presently attempt to show that the hitherto anomalous genus *Grabowskya*, is referrible to a position between *Borragineæ* and *Nolaneæ*, and *Dichondreæ* will then form an excellent connecting link between *Nolaneæ* and *Convolvuleæ*, to the former of which this small group has a very close affinity, on account of the almost gynobasic origin of its nearly distinct carpels, and also because its embryo is really cyclical, notwithstanding that the cotyledons, at their extremity, are bent back in a sigmoid form, after having completed more than an entire helix, somewhat in the manner of the embryo of *Convolvulus*, but it is to be remarked, that although the cotyledons of *Dichondra* are broader than the radicle, and more foliaceous than those of *Nolaneæ*, they are simply parallel, and have not their margins crumpled and conduplicated, as in the true *Convolvuleæ*. Doctor Lindley observes (*Nat. Syst.* 230) that 'if we attend to the embryo, they will stand among *Convolvulaceæ*, if to the carpels, among *Nolanaceæ*: upon the whole the latter must be accounted of the most importance, and consequently it is with *Nolanaceæ* that I arrange them." I find on examining the seed of *Dichondra repens*, that the utricle falls away from its receptacular attachment, showing a distinctly round perforate aperture at base, and on the receptacle are to be seen opposite the opening, two distinct prominences, corresponding to what, by analogy, may be

considered as of a similar nature to the areolar processes observed in *Nolaneæ* and *Grabowskya*. The reasons above offered will therefore probably justify the position I have ventured to assign for *Nolanaceæ* in the general system, so that without violating the connexion already established by the authority of the most distinguished Botanists, between *Dichondreæ* and *Convolvuleæ*, they will stand after *Borragineæ*, and before *Convolvuleæ* through the intermedium of *Dichondreæ*.

The new genera of *Nolanaceæ*, proposed as before alluded to by Doctor Lindley, although not so well distinguished by characters derived from the inflorescence, are nevertheless well marked by a distinct and peculiar habit, aided by differences of structure in the fruit. Most of the species comprised under *Nolana* and *Sorema*, are succulent prostrate plants with broad fleshy leaves; in the latter genus, the leaves are geminate, the inner one petioled, the outer one sessile, with one of its margins decurrent on the stem. The species included by *Alona*, *Dolia* and *Aplocarya*, are mostly erect plants with a shrubby habit, and approximate or fasciculated linear leaves, many of them being densely covered with tomentum; the flowers of the two last mentioned genera are proportionately very small, those of the others presenting large campanulate flowers, resembling those of *Convolvulus*. It is worthy of remark, that all the plants of this order, grow either within reach of the humidity of the sea, or in inland tracts where the soil is impregnated with particles of salt or natron. The genus in which the plant about to be described is placed may be thus defined.

Sorema Lindl.—*Calyx* tubuloso-campanulatus, 5-angulatus, imo toro adnatus, limbo 5-partito, lobis erectis acuminatis obtusiusculis, persistens. *Corolla* hypogyna, infundibuliformis, limbo amplo, campanulato, plicato, obsolete 5-lobo, lobis brevissimis, emarginato-mucronatis. *Stamina* 5, inæqualia, inclusa; *filamenta* erecta, breves, imo corollæ orta, basi pilosa; *antheræ* basifixæ, 2-lobæ, rotundatæ. *Discus* hypogynus, carnosus, margine libero. *Ovaria* 20, ad

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Pionandra (Eurythystemon) capsicoides.

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PLATE IX.

Exhibits a portion of *Pionandra (Euthystemon) capsicoides*. *Fig.* 1, the calyx; *Fig.* 2, a portion of the corolla, with three of the stamens, to show their position and mode of origin: *all nat. size*; *Fig.* 3, a segment of the corolla; *Fig.* 4, stamens, seen in different positions: *all magnified*; *Fig.* 5, pistillum: *nat. size*; *Fig.* 6, style and stigma: *magnified*; *Fig.* 7, section of the same.

PLATE X.

Shows a portion of *Sorema paradoxa*. *Fig.* 1, the calyx; *Fig.* 2. the same, partly cut away to show the relative size and position of the entire pistillum; *Fig.* 3, corolla cut open; *Fig.* 4, the stamens: *all nat. size*; *Fig.* 5, the stamens *magnified*, and seen in different positions, before and after dehiscence; *Fig.* 6, a portion of the style and stigma; *Fig.* 7, fleshy 5-lobed disc upon the torus (with the calyx cut away), together with the included ovaria, the style, and stigma; *Fig.* 8, vertical section of the same, with the ovaria removed to show the central gynobase and points of attachment of the ovaria: *all more or less magnified*; *Fig.* 9, Drupes: *nat. size*; *Fig.* 10, the same *magnified*, with a single cell in each; *Fig.* 11, a drupe, with a nut having three cells; *Fig.* 12, a vertical section of a one-celled nut; *Fig.* 13, front, side-view, and section of the operculum that closes the aperture leading into each cell; *Fig.* 14, seed removed, seen in front; *Fig.* 15, the same viewed edgeways; *Fig.* 16, transverse section of the same; *Fig.* 17, vertical section of ditto, showing the position of the embryo within the albumen. *Fig.* 18, the embryo removed: *all magnified.*

PLATE XI.

Shows *Alibrexia rupicola*. *Fig.* 1, is a flower; *Fig.* 2, the same, with the calyx thrown back to show the stipitate base of corolla, and the line of its circumscissure; *Fig.* 3, the corolla cut open; *Fig.* 4, stamens before and after dehiscence; *Fig.* 5, the transverse section of an anther; *Fig.* 6, ovaria upon the gynobase; *Fig.* 7, calyx, induvial remains of corolla, disc, and ovaria, seen from above; *Fig.* 8, vertical section of the same, showing the stipitate remains of the corolla after it falls off, the mode of insertion of the ovules and style upon the gynobase; *Fig.* 9, the induvial base of the corolla; *Fig.* 10, the style and stigma: *all magnified;* *Fig.* 11, the ripe drupes, with the persistent calyx: *nat. size;* *Fig.* 12, the same: *magnified;* *Fig.* 13, the same, with the drupes removed; *Fig.* 14, a 2-celled nut, seen from its base; *Fig.* 15, a single-celled nut, seen sideways; *Fig.* 16, a vertical section of ditto; *Fig.* 17, the nucleus removed, with the strophiole; *Fig.* 18, vertical section of albumen and embryo; *Fig.* 19, hairs of the pubescence: *all much magnified.*

PLATE XII.

Is a representation of *Dolia vermiculata*. *Fig.* 1, the flower: *nat. size;* *Fig.* 2, the same: *magnified;* *Fig.* 3, the calyx: *nat. size;* *Fig.* 4, the same: *magnified;* *Fig.* 5, the corolla cut open; *Fig.* 6, a stamen before and after dehiscence; *Fig.* 7, the entire pistil, with the calyx thrown back to show the stipitate 5-lobed disc: *all magnified;* *Fig.* 8, the fruit: *nat. size;* *Fig.* 9, a nut seen in three points of view; *Fig.* 10, section of nut; *Fig.* 11, operculum; *Fig.* 12, seed removed from nut, with strophiole and operculum attached; *Fig.* 13, albumen; *Fig.* 14, longitudinal section of the same; *Fig.* 15, embryo removed; *Fig.* 16, a leaf, seen in front and edgeways: *all magnified.*

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Sorema paradoxa.

Alibrexia rupicola.

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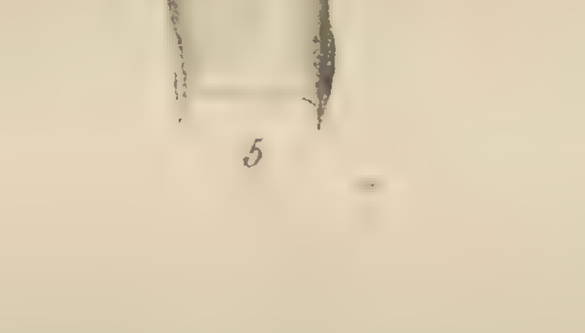

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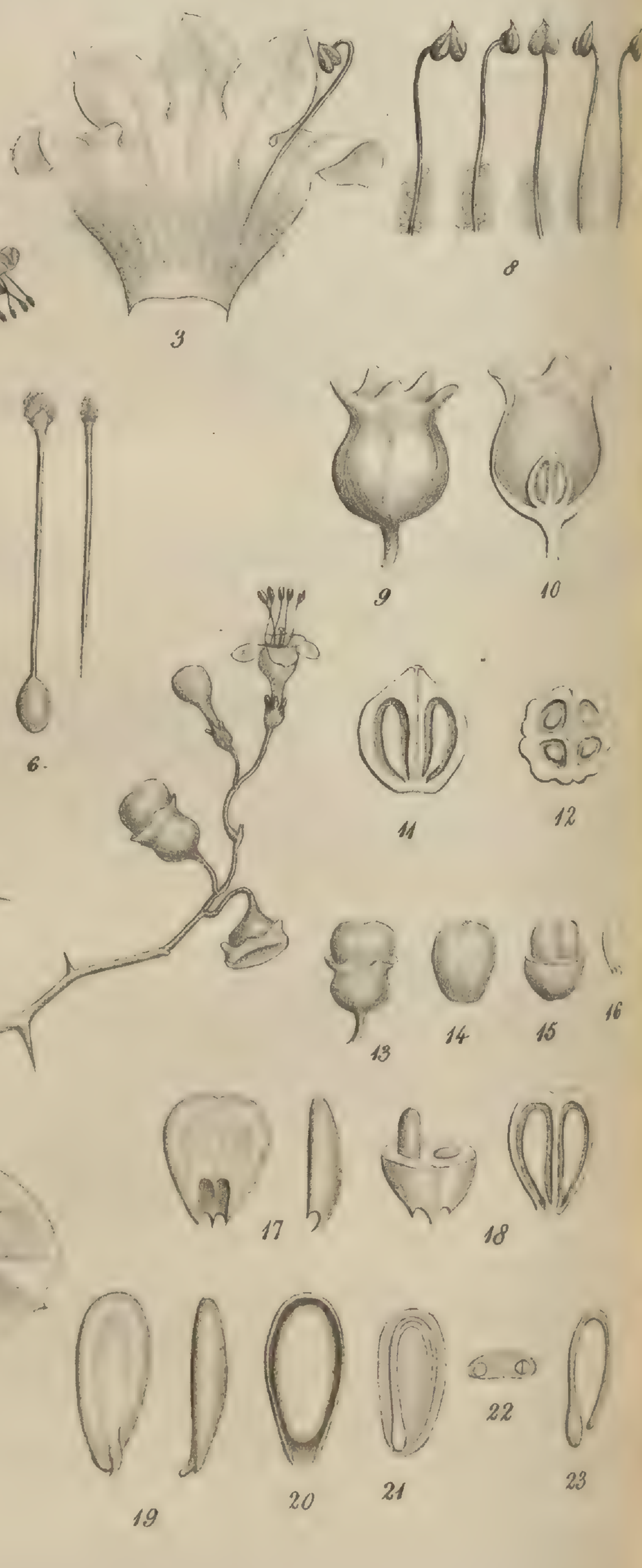
Dolia vermiculata.



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Grabowskya obtusa

PLATE XIII.

Shows a drawing of *Grabowskya obtusa*. *Fig.* 1, is the flower; *Fig.* 2, the corolla: *nat size*; *Fig.* 3, the corolla, cut open and *magnified*; *Fig.* 4, the calyx; *Fig.* 5, the pistillum: *both nat. size*; *Fig.* 6, the same *magnified*, the stigma being seen both in front and edgeways; *Fig.* 7, the stamens: *nat. size*; *Fig.* 8, the same: *magnified*; *Fig.* 9, the calyx; *Fig.* 10, section of calyx and ovarium: *both magnified*; *Fig.* 11, longitudinal section of ovarium; *Fig.* 12, transverse section of ditto: *both more highly magnified*; *Fig.* 13, the fruit; *Fig.* 14, the berry, removed from the persistent calyx; *Fig.* 15, the same, with half of the sarcocarp removed; *Fig.* 16, the nut: *all nat. size*; *Fig.* 17, the nut, seen both inside and edgeways; *Fig.* 18, transverse and longitudinal sections of ditto: *all magnified*; *Fig.* 19, seed, seen in front and edgeways; *Fig.* 20, the same, with half of the testa removed, showing the albumen; *Fig.* 21, longitudinal section of albumen and embryo; *Fig.* 22, transverse section of ditto; *Fig.* 23, embryo extracted: *all more highly magnified.*

PLATE XIV.

Exhibits *Metternichia princeps*. *Fig.* 1, the calyx; *Fig.* 2, the corolla, with the upper part removed and thrown back, and the lower portion of the tube cut open to show the stamens and mode of their insertion: *all nat. size*; *Fig.* 3, the anthers; *Fig.* 4, transverse section of the same; *Fig.* 5, anther after dehiscence: *all magnified*; *Fig.* 6, a grain of pollen: *highly magnified*; *Fig.* 7, longitudinal section of calyx, and of the lower portion of tube of corolla, with the enclosed pistil: *nat. size*; *Fig.* 8, a section of the ovarium; *Fig.* 9, the same, with the ovules removed, showing the dissepiment and the points of their insertion upon it; *Fig.* 10, stigma, seen in two points of view: *all magnified*; *Fig.* 11, capsule, after dehiscence; *Fig.* 12, transverse section of the same, showing the dissepiment, with eight seeds in each cell; *Fig.* 13, seeds, seen in three points of view; *Fig.* 14, transverse section of the same to show its 3-winged margins; *Fig.* 15, longitudinal section of the same; *Fig.* 16, albumen; *Fig.* 17, longitudinal section of the same; *Fig.* 18, embryo removed, seen in front and edgeways: *all nat. size.*

PLATE XV.

Is *Sessea stipulata*. *Fig.* 1, a flower and bract; *Fig.* 2, the calyx; *Fig.* 3, a flower, with half of the calyx removed to show the stipitate base of the corolla: *all nat. size*; *Fig.* 4, corolla cut open: *magnified*; *Fig.* 5, a stamen, showing the scabrid anther; *more magnified*; *Fig.* 6, pollen grains: *highly magnified*; *Fig.* 7, stellate and stipitate hairs of the pubescence; *Fig.* 8, section of calyx, and induvial remains of corolla to show the enclosed stipitate pistil: *all magnified*; *Fig.* 9, capsule, with persistent calyx: *nat. size*; *Fig.* 10, the same: *magnified*; *Fig.* 11, the same, with the calyx cut open to show the stipitate capsule; *Fig.* 12, the two valves of the capsule, with the dissepiment separated, seen edgeways; *Fig.* 13, transverse section of capsule; *Fig.* 14, the dissepiment, with the points of attachment of the seeds; *Fig.* 15, seeds; *Fig.* 16, a transverse section of a seed, showing its 3-winged margins; *Fig.* 17, the albumen removed: *all magnified*; *Fig.* 18, a longitudinal section of the same; *Fig.* 19, the embryo extracted, seen in front and edgeways: *all still more magnified.*

PLATE XVI.

Gives a view of *Cestrum Organense*. *Fig.* 1, a flower expanded, with its peculiar bract; *Fig.* 2, the calyx; *Fig.* 3, the corolla removed, showing the induplicate mode of its æstivation; *Fig.* 4, the same, cut open: *all nat. size*; *Fig.* 5, the stamens: *magnified*; *Fig.* 6, grains of pollen: *very highly magnified*; *Fig.* 7, the pistil; *Fig.* 8, stigma, with a portion of the style; *Fig.* 9, a section of the calyx, with the induvial remain of the corolla, enclosing the ovarium; *Fig.* 10, longitudinal section of the same, showing the stipitate ovarium, and the mode of attachment of its ovules: *all magnified*; *Fig.* 11, berry, with the persistent calyx; *Fig.* 12, longitudinal section of the berry, with the seeds enclosed; *Fig.* 13, seeds, seen edgeways and on the ventral face, showing the hilum in the centre; *Fig.* 14, albumen; *Fig.* 15, section of the same, with the enclosed embryo; *Fig.* 16, embryo removed, seen in front and edgeways: *all nat. size.*

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Metternichia princeps

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Sefsea stipulata

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Cestrum Organense.

PART. 3

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MDCCCXLVI.

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40 distincta, supra discum pluri-serialiter disposita, 1-ovulata.* *Stylus* centralis, breviusculus, pentagonus. *Stigma* clavatum, 5-lobum. *Drupæ* totidem ; nux angulata, endocarpio crasso, textura coriacea, spongiosa, 1-6-locularis, loculis 1-spermis, basi perforatis, apertura omnino clausa, operculo a semine demum secedente. *Embryo* filiformis intra albumen carnosam cyclicus, *cotyledonibus* semiteretibus, *radicula* ad hilum spectante.—Herbæ *Chilenses annuæ prostratæ carnosulæ*, floribus *speciosis Convolvulaceis*.

1. Sorema *paradoxa*, Lindl. *Bot. Reg.* 1844, *tab.* 46. Nolana paradoxa *Lindl.* (*non Hook.*) *Bot. Reg. tab.* 865.—prostrata, pubescens : foliis geminatis, ovatis, obtusis, spathulatis, altero subsessili, subdecurrenti; pedunculo axillari, folii longitudine; corollæ limbo amplo, campanulato, cæruleo, fauce albo.—Concon, Chile.

This plant is so well known, that it needs no particular description : all that is worthy of mention is the structure of its fruit, which I do not think has been yet sufficiently detailed. The peculiarity of this genus as established by Dr. Lindley is, that its many carpels are all perfected into an equal number of 1-seeded *drupes* ; but I have observed sometimes in the above species, though it rarely happens, that 2-3 nuts are combined into one, which is then 2-3 celled, each cell having a single seed. In habit it approaches the typical genus *Nolana*. The *nut* is smooth, unequally rhomboidal, sharp-angular, of a spongy coriaceous consistence, the place of its basal attachment being marked by a small round cicatrice, being the area of a hard cylindrical operculum that closes the channel leading into the included cell. The *seed* which fills the cavity is reniform and compressed, the *testa* is yellow, reticulate, and crisp, the inner integument is a very thin transparent membrane enclosing the *albumen*, which is white, hard and fleshy ; the *embryo* is white, filiform, bent in a somewhat spiral form, the *radicle*

* Although the disc is partially adnate, it is not so distinctly stipitate as in *Dolia* and *Alibrexia*, for the lobed margin is quite free, and the corolla arises below it upon the line of junction of the base of the disc with the calyx and torus as shown in fig. 7 and 8, Plate 10.

Mo. Bot. Garden
1904.

pointing towards the hilum, or aperture of the cell: the *cotyledons*, which together are somewhat more slender than the radicle, are about the same length.*

var. *β. atriplicifolia*:—procumbens, subpubescens; foliis spathulatis, radicalibus majoribus, forma *Atriplicis hortensis;* calyce campanulato, lobis ovato-lanceolatis, acutis; corollæ tubo intus flavo, fauce albo, limbo amplo, cæruleo. *Sorema atriplicifolia* Lindl. *Nolana atriplicifolia* D. Don. *Sweet, Fl. Gard. n. ser. tab.* 305:—Peruvia? an potius Chile?

The figure given in the work above cited, exhibits the cauline leaves to be about $1\frac{1}{2}$ in. long, and 1 in. broad, they are wavy, fleshy, broadly oblong, obtuse, subulate at base, on a very broad decurrent petiole, one of the margins of which is continuous along the angle of the stem. This variety is known only from cultivated specimens, raised from seeds said to have been obtained from Peru, and I have not been able to learn of its existence in any herbarium; but I have just seen in a living state a cultivated species that corresponds with the figure last quoted, from which it appears to me only a more luxuriant form of *Sorema paradoxa*. I therefore, consider them, to be identical, and the stated place of origin of the cuitivated variety, (Peru), to have been mistaken for that of Chile.

2. Sorema *litoralis* (n. sp.)—herbacea, prostrata; radice fusiformi, ramulis plurimis, e collo radiatis; foliis radicalibus majoribus, longe petiolatis, cordato-ovatis, obtusis, caulinis geminis, inæqualibus, obovatis, obtusis, uno sessili, altero subspathulato, late petiolato, decurrenti: floribus solitariis, corolla ampla, cærulea.—Chile, Valparaiso, *v. s. in herb. meo (Mathews;) in herb. Hooker, (Cuming. n.* 627, *Bridges n.* 327.)

This plant grows sparingly on a sandy beach, within reach of the spray of the sea: its tap root descends to a depth of 6 or 8 inches: its branches, springing from the neck, spread along the sand in all directions; the radical leaves have a narrow petiole, about an inch long, and barely a line broad,

* A figure of this species is given in PLATE 10.

the blade being nearly 10 lines long, and 8 lines broad: the cauline leaves are only half that size, in unequal pairs, the outer one being sessile, and decurrent on the stem as in the preceding species, the younger leaves, peduncle, and calyx are pubescent, but the older leaves and stem are glabrous: the calyx is 5-angular, 5 lines long, divided half way down into 5 triangular erect teeth: the corolla resembles that of *S. paradoxa:* the nuts are about 16, with sharp angles, each 1-celled.

3. Sorema *acuminata* (n. sp.) :—fruticulosa, prostrata; caulibus ramosis, angulatis; foliis geminis, pubescentibus, lanceolatis, lineari-acuminatis, oblique sessilibus, margine exteriori decurrenti: floribus axillaribus, solitariis, cœruleis; nuculis distinctis 35, parvis, foveolatis.—Chile ad Concepcionem: (*v. s. in Herb. Hooker, n.* 1322.)

The stem is almost 4-angular; the leaves are nearly amplexicaul at base, where they are fixed obliquely on the stem, the lower edge being decurrent; they taper gradually upwards, and are linearly acuminate, are about 1½ in. long, and 3 lin. broad at base; the younger ones are pubescent, but they soon become glabrous; the peduncle is compressed, 6-7 lin. in length, and together with the calyx is covered with long, soft pubescence; the calycine tube is turbinate, pentagonous, 4 lin. long, with five equal erect, triangular, acuminate lobes of equal length; the corolla is about the size of that of *S. paradoxa,* with a broad campanulate border of a blue colour. The nuts are scarcely as large as rape seeds, black, deeply foveolated with very sharp angles; on one receptacle I found 35 distinct nuts, all 1-celled.

4. Sorema *lanceolata* (n. sp.) :—herbacea, prostrata, incano-pubescens; caule subangulato; foliis geminis lanceolatis semiamplexicaulibus, basi oblique adnatis, hinc decurrentibus; floribus in axillis solitariis, speciosis, cæruleis.—Chile ad Coquimbo. *v. s. in herb. Hooker,* (*Cuming,* n. 856.)

The whole plant is furnished with incanous pubescence; the younger leaves, peduncles and stems, are ciliated and

covered with very thick articulate hairs; the leaves are somewhat spathulate, lanceolate, oblique at base, and decurrent on the stem, as in the former species, they are 1¼ in. long, 4-6 lin. broad; the peduncle is compressed, 1¼ in. long. the calyx is campanulate, 5-angled, 6 lin. long; the teeth being half that length, and lanceolate; the corolla is 1¼ in. long, and much resembles that of *S. paradoxa.*

5. Sorema *longifolia.* Alona longifolia *Lindl. loc. cit*:—herbacea, prostrata; caule crasso; foliis geminis, linearilanceolatis, subspathulatis, alato-petiolatis in caulem hinc decurrentibus, parce et molliter pubescentibus; floribus speciosis solitariis, axillaribus, cæruleis.—Chile ad Coquimbo. *v. s. in herb. Hooker,* (*Cuming.* n. 887).

This is evidently a succulent prostrate plant, with a fleshy stem 3 lin. in diameter, and with axils 1 in. apart; the leaves are 3 in. long, ½ in. broad, spathulate and decurrent; the pedicel is 1¼ in. long; the calyx is altogether 9 lin. long, the linear segments measuring 5 lin.; the corolla is 1½ in. long, with a broad campanular blue border as in *S. paradoxa.* Doctor Lindley mentions having found in one receptacle 7 drupes, viz: 1-4-celled, and 6-1-celled, in all ten cells: in the one I examined I found 4 nuts, each 6-celled, 1-3-celled, and 8-1-celled, in all 13 nuts, with 35 cells; it is worthy of remark that all the seeds do not produce a perfect embryo.

6. Sorema *linearis* (n. sp.):—herbacea, glanduloso-pilosa, demum subglabra; ramulis angulatis; foliis linearibus, obtusis, hinc decurrentibus; floribus solitariis, axillaribus. —Chile ad Conceptionem. *v. s. in herb. Hooker.* (*Bridges,* n. 1323).

This is probably a procumbent plant; the younger leaves are covered with dense glandular tomentum; they are decurrent on the stem as in the preceding species, 1⅛ in. long, 2-2½ lin. broad; the peduncle is ½ to ¾ in. long; the calyx is short, 5-angular, with lanceolate segments, altogether 5 lin. long, and covered with soft pubescence; the corolla is of the same shape, but smaller than that of *S. paradoxa,* and in the dried state is of a yellow colour. In one case, I found 2 of

the nuts 3-celled, 3-2-celled, 15-1-celled, in all 6 nuts with 27 cells; in another instance I observed 1-4-celled, 1-3-celled, 3-2-celled, and 5-1-celled, in all 10 nuts with 18 cells.

From the above details it may be inferred that as the nuts differ so constantly in their number, and as in each nut the number of cells is so uncertain, differing even in the same plant, this feature can no longer be considered a good generic character. I have examined the plants above described. with much attention, and cannot perceive any mark to distinguish *Alona* from *Sorema*, except that in the former the species are all erect plants with woody stems, and fasciculate, terete, or 3-gonous leaves, while those of the latter are herbaceous, prostrate plants, with geminate broad, fleshy leaves, which in every case appear decurrent on the stem. I have had no opportunity of examining more than one out of the 5 species of *Nolana* enumerated by Dr. Lindley, and that has not enabled me to appreciate the distinction between that genus, *Sorema*, and *Alona*. In *Nolana* the species are all succulent prostrate plants, mostly with geminate leaves, which are both petiolated, and are not decurrent on the stem, as in *Sorema;* in all the 3 genera the flowers closely resemble each other; in *Nolana tenella*, Lindl., I found 5 nuts, which were either 1-3-4 or 5-celled; if no difference then can be detected in the flower or the seeds, habit alone remains to draw a line of distinction between them, and a question arises whether habit alone will be considered sufficient to separate these plants into 3 genera. Should they all verge into *Nolana*, this genus might then with propriety be divided into 3 sections:—1. *Eunolana*, comprising the 5 species alluded to; 2. *Sorema*, containing the 6 species above enumerated; and 3. *Alona*, embracing 8 species, viz: 1. *A. cælestis*, 2. *A. rostrata*, 3. *A. obtusa*, 4. *A. glandulosa*, 5. *A. carnosa*, and 6. *A. baccata* of Dr. Lindley, together with two new species described below. It is to be hoped that some Botanist, possessing the means of examining these plants, if possible in the living state, will observe whether any tangible and constant characters exist between them, or whether from the similarity of their structure, they should

all become referrible to *Nolana* as above suggested; but in the mean time it is not unfair to presume, from the indications alluded to, that some good generic differences may yet be discovered, when the plants have been more carefully examined.

7. Alona *ericifolia* (n. sp.) :—fruticulosa, glanduloso-pubescens, ramulis sub-dichotomis; foliis fasciculatis confertis linearibus, margine revolutis et tunc teretibus; floribus speciosis cæruleis; calyce tomentoso, tubo 5-gono, lobis erectis, lineari-acuminatis; corollæ limbo amplo campanulato; nucibus paucis, magnis, baccatis, plurilocularibus.—Chile ad Conceptionem. *v. s. in herb. Hooker.* (*Bridges*, n. 1325).

This is apparently a low-growing suffruticose branching plant, distinguished by its numerous close fascicles of narrow linear leaves, which are about $\frac{1}{2}$ in. long. and $\frac{1}{2}$ a lin. wide, somewhat broader towards the apex, the margins being rolled back on the mid-rib, so as to assume a perfectly terete form, they are covered with dense short, glandular tomentum. The flowers are about the size and shape of those of *Sorema paradoxa*. The calyx is funnel-shaped, about $\frac{1}{2}$ inch long. the acuminate lobes being about one third of its length, and somewhat curved outwards, as in *A. cælestis*, and *A. rostrata*.

8. Alona *microphylla* (n. sp.) :—fruticulosa, ramulis tortuosis nodosis; foliis parvis, fasciculatis, confertis, spathulato-oblongis, carnosulis, viscidulo-pubescentibus; floribus solitariis, mediocribus, calyce campanulato, ad medium 5-partito, lobis late triangularibus, pubescenti, pilis glandulosis, aliisque articulatis; corolla pubescenti, limbo amplo campanulato, staminibus styloque exsertis.—Chile ad Conceptionem. *v. s. in herb. Hooker.* (*Bridges*, n. 1330).

This is another low growing suffruticose species, with very much the habit of some of the small-leaved *Lyciums*. The stem and lower portion of the branchlets are tortuous, bare, and knotty; the leaves are close, about 3 lin. long, $\frac{1}{2}$ to 1 lin. broad, spathulate, nerveless, fleshy, and covered with short, viscid, glandular hairs. The peduncles are ciliate,

½ in. long; the tube of the calyx is 2 lines in length, as well as in diameter, having 5 equal, broad, triangular, erect lobes, 2 lin. long; the corolla is 1 in. long, broadly campanulate, with 5 rounded lobes.

Dolia, *Lindl.*

This genus was proposed by Prof. Lindley for a plant brought by Mr. Cuming from Chile, and which I obtained many years ago from Dr. Miller, of H.M.S. Dublin, who collected it in Concepcion. Although unquestionably belonging to *Nolaneæ*, it has more the habit and inflorescence of a *Fabiana*, from the flower of which it is scarcely distinguishable. The following is offered as a more extended generic character than that given by its distinguished author.

Dolia Lindl.—*Calyx* persistens, tubulosus, limbo 5-partito, lobis lineari-acuminatis, carnosulis, obtusiusculis. *Corolla* hypogyna, fere hypocrateriformis, tubo ore ampliato, limbo ad basin 5-fisso, lobis brevibus rotundatis apice vix mucronulatis. *Stamina* 5, inæqualia, inclusa, rarius exserta; *filamenta* erecta, medio corollæ inserta, filiformia; *antheræ* basifixæ, 2-lobæ, lobis rotundatis, longitudinaliter dehiscentibus. *Discus* hypogynus, carnosus, substipitatus, margine 5-lobo libero gynobasin cingens. *Ovaria* 8-10, coadunata, 1-ovulata. *Stylus* centralis, filiformis. *Stigma* clavatum. *Drupæ* totidem, carnosæ, demum siccæ, vernicosæ; *nux* ovalis, 1-6-locularis, basi operculo clausa. *Semen* ut in congeneribus.

Fruticuli Chilenses, *erecti, ramosissimi;* ramulis *brevibus flexuosis, interdum cottoneo-floccosis;* foliis *fasciculatis, minimis, spathulatis, carnosulis, pilosis;* floribus *parvis, solitariis, terminalibus, v. axillaribus.*

1. Dolia *vermiculata* Lindl. :—ramis niveo-cottoneis; foliis brevissimis, spathulatis, rotundatis, crassis; calycis dentibus carnosis, sub-recurvis, tubo corollæ multo brevioribus.—Chile ad Conceptionem. (*Cuming*, n. 893, *Bridges*, n. 1336.

This is an erect low-growing shrub, with slender woody stems, and numerous short flexuose branchlets, which are densely covered with long white cottony hairs; the leaves are fasciculated, linear, spathulate with fleshy rounded summits, pubescent, scarcely 1 line in length; the flowers are terminal, solitary, and erect, hardly more than $\frac{1}{2}$ inch long, and $1\frac{1}{2}$-2 lines diam.; the calyx is $1\frac{1}{2}$ line long; 5 to 8 small drupes become matured in each calyx, in the specimen I examined I found 6, of which one was 2-celled, and five were 1-celled, with a single seed in each cell; the nuts are ovoid, rounded, somewhat angular, the basal point of attachment being small, and the opening into each cell marked by a round scar or areola, as in Sorema.*

2. Dolia *salsoloides*, Lindl.—ramis calvis junioribus pube brevissima sparsis; foliis fasciculatis linearibus fere glabris, calycis dentibus linearibus, obtusis, subpubescentibus, tubo corollæ fere æqualibus.—Chile. (*Macrae*).

The leaves of this species are 4 lines long, $\frac{1}{4}$ line broad, slightly ciliated, or exhibiting under a lens a few scattered articulated hairs; the peduncle is about the length of the leaves; the calyx is about 3 lines long, divided half way down into 5 segments, which are linear, obtuse, fleshy, and sparsely covered with short pubescence; the corolla is about 4 lines long.

3. Dolia *clavata* (n. sp.).—omnino calva; foliis fasciculatis, carnosulis, lineari-spathulatis, imo pulvinatis; calycis dentibus linearibus, obtusis, tubo corollæ dimidio brevioribus; staminibus exsertis, filamentis basi sericeis.—Chile ad Conceptionem. *v. s. in herb. Hooker.* (*Bridges*, n. 1324.)

This species has much the aspect of the last, but the leaves are broader, spathulate and rounded, 3 lines long, and 1 line wide, they are quite glabrous and fleshy; the peduncle is of the same length as the leaves; the calyx about 2 lines long, is divided halfway down, its segments being linear, obtuse,

* A figure of this species is shown in Plate 11, together with sectional details.

and somewhat thickened at the apex; the corolla is about 6 lines long, with oblong reflected segments, the stamens being exserted, the filaments arising about the middle of the tube, from as many dense velvety tufts, above which they are glabrous, as is likewise the style; the ten ovaries are arranged in 2 series on a conical receptacle, the margin of the surrounding disc being erect and obsoletely lobed.

3. Dolia *leptophylla*, (n. sp.):—fruticulosa, tota pubescens, ramulis teneris fusco-cottoneis foliis fasciculatis, lineari-teretibus, incurvis; calyce parvo, lobis triangularibus, attenuatis: corolla cærulea, tubo inferne gracili, superne ampliato, campanulato, lobis parvis rotundatis; nucibus rotundatis, nigris, rugosis.—Peruvia. *v. s. in herb. Hooker. Cuming, n.* 956.

The above specimen is small, apparently a portion of an erect low-growing shrubby plant. The leaves are barely $\frac{1}{2}$ an inch long and half a line broad, covered with dense grey tomentum: the peduncle is scarcely 2 lines long; the calyx is small, only $1\frac{1}{2}$ to 2 lines in length, with triangular erect teeth; the corolla, about 8 lines long, is very slender at base, spreading above in a bell-shaped tube, with a 5-lobed margin. The seeds are black, shining, rounded, covered with rugous prominences: on one receptacle I observed 1 of the nuts to be 6-celled, 1-4-celled, 1-3-celled, 2-1-celled. in all 5 nuts with 15 cells.

4. Dolia *laxa* (n. sp.)—fruticulosa, tomentosa, ramulis gracilibus laxis; foliis sparsis, lineari-spathulatis, acutis, glanduloso-pubescentibus; floribus axillaribus, parvis. Canta? Peruviæ.—*v. s. in herb. Hooker.*

This specimen, or rather fragment of one, was sent from Peru by Mathews, where he states it to have been obtained out of a collection made by Ruiz and Pavon, then existing in Lima. It has quite the habit of the species above described, but the axils are nearly an inch apart, the leaves in pairs, being $\frac{3}{4}$ in. long, and barely a line in width, they are tomentous and fleshy; the flowers are solitary in each axil, the peduncle is only 1 line, and the calyx, deeply cleft into 5

linear acute segments, is scarcely more than a line in length. The tube of the corolla, which is slender below, swells considerably above.

Alibrexia.

Under this name I propose a new genus for a prostrate plant that I found growing upon the rocks in the Caleta of Concon in Chile, in the year 1823, where it was constantly exposed to the spray of the sea, whence its name, from αλιβρεξῶ, *mare madefacio*. It differs from *Nolana* and *Sorema* by having 10 carpels supported upon a distinctly stipitate disc quite free from the calyx, by a more tubular corolla with a border cleft to the base into 5 very small rounded reflexed lobes as in *Dolia*, and by its drupes with rounded oval nuts umbilicate at base, the perforation not being wholly filled up by a woody operculum or strophiole-like process, and by the constant adhesion of this process to the testa. It differs from *Nolana* and *Alona*, in having a somewhat fleshy corolla, with a small 5-lobed border, not one that is broad, deep and campanular. From *Dolia* it is distinguished by its herbaceous, fleshy and prostrate habit, not being suffruticose with a decidedly woody erect stem: by its stamens arising from the base of the corolla, not simply fixed in the middle of the tube: by its calyx being cleft nearly to the base, by the greater number of its ovaries, by its nuts being quite rounded, and narrowed at base to a slight ring around the areolar cicatrice. It differs from *Aplocarya* (a genus hardly distinct from *Dolia*) in the want of the very conspicuous, large, cicatrized base of its drupes, to which a portion of the withered receptacle and disc often remains attached, in having 10 distinct ovaria, and a more infundibuliform and less hypocrateriform corolla, and by its stamens not being exserted. It differs from all others by its ramified and stellate, not simply articulate pubescence. As in *Dolia* and *Aplocarya*, the tube of the corolla is quite free, both from the fleshy disc and the calyx, but in *Alibrexia* it falls off by a horizontal line parallel with the disc, leaving it surrounded

by a hollow cup. The following is the outline of its generic character.

ALIBREXIA (gen. nov.)—*Calyx* persistens, utrinque dense tomentosus, 5-partitus, lobis linearibus vel 3-angularibus obtusiusculis erectis. *Corolla* hypogyna, inferne tubulosa, superne tubuloso-campanulata, limbo ad basin 5-partito, laciniis parvis rotundatis reflexis. *Stamina* 5, inæqualia, inclusa; *filamenta* imo tubi orta, basi villosa, hinc subulata graciles, inæquales, tubo corollæ breviores: *antheræ* basi-fixæ, oblongæ, 4 sulcatæ, 2-loculares, longitudinaliter dehiscentes. *Discus* hypogynus breviter stipitatus, patelliformis, margine crasso, 5-lobo, 10-crenato, gynobasin centralem cingens. *Ovaria* 10, distincta, circa gynobasin conicam biserialiter aggregata, et angulo interno affixa, 1-ovulata. *Stylus* centralis, 5-striatus, longitudine staminum. *Stigma* clavatum, 5-lobum. *Drupæ* (alteris abortivis vel coalitis) 5-8, distinctæ, carnosulæ, demum siccæ; *nux* ovoideo-rotundata, subossea, 1-4 locularis, loculis 1-spermis, basi imminuto 1-4-foveolato, fovea operculo semi-clausa. *Semen* solitarium, reniforme, compressum, testa tenui operculo persistente affixa. *Embryo* filiformis, intra albumen carnosum cyclicus, *cotyledonibus* semiteretibus, *radicula* ad hilum spectante.

Plantæ *suffruticulosæ Chilenses, prostratæ, succosæ, in saxis mare adspersis incolæ;* caulibus *ramosis, basi subligneis;* ramulis *succosis;* foliis *alternis, sub-confertis, lineari-spathulatis, carnosis, velutino-tomentosis, pilis ramoso-articulatis, vel stellatis;* floribus *parvis, axillaribus, pedunculatis.*

1. ALIBREXIA *rupicola*:—prostrata; foliis lineari-spathulatis, confertis, tomentosis: floribus solitariis, axillaribus, pedunculo calyceque utrinque tomentoso, calycis laciniis linearibus, corolla parce pubescenti, violascenti-albida.—Chile, ad Concon.

The plant spreads itself in a dense mass upon the surface of the rock to which it is attached, is frequently washed by the surf, and constantly exposed to the spray of the sea.

The leaves are small, linear, spathulate, with a rounded apex, fleshy, and covered on both sides with dense, short, dark grey tomentum: they are about 8 lines long, and barely a line in width: they are attached to the stem by a small glabrous pulvinate gland: the peduncle is slender, half an inch long; the calyx is 2 lines long, cleft nearly to the base, with narrow linear segments tapering upwards, it is tomentous both within and without. The corolla is barely half an inch long, slender within the calyx, it swells above in a somewhat campanular form, is of a pale lilac colour, rather fleshy, and slightly pubescent outside; the border is narrow, and divided to its base into 5 short, rounded, reflected lobes, having at the apex a minute toothlet: the stamens are wholly included, and are somewhat unequal in length, the filaments slender, tapering, and glabrous, arise out of dense hairy tufts in the base of the corolla. The disc is distinctly stipitate, cup-shaped, and quite free both from the corolla and calyx, its border nearly erect, is formed of 5 confluent lobes, with a margin divided into 10 distinct crenatures; the gynobase arises in a conical form within the centre of this cup, the intermediate cavity being filled by the carpels which are arranged in 2 series, and are attached by a ventral, and almost basal point to the gynobase: from the centre of this arises the style, which is columnar, 5-grooved, glabrous, and surmounted by a 5-lobed, hollow, clavate stigma. The drupes are small and fleshy, enclosing an ovoid rounded nut, which is of a more woody texture than most of its congeners: this is usually 1-celled, sometimes 2-celled, the base of each cell being marked by an areolar cicatrix, which is partly hollow, the bottom of the cavity being filled up by the strophiole-like process that remains attached to the testa of the included seed. The testa, smooth, somewhat membranaceous, and of reticular texture, encloses the albumen, which is fleshy, and not very copious: in this is imbedded the filiform embryo, whose semiterete cotyledons are bent round in a nearly circular form, while the terete radicle, which is only slightly curved, and somewhat thickened towards its extre-

mity, terminates at a point close to the attachment of the process before mentioned.*

2. ALIBREXIA *tomentosa*. Alona tomentosa, *Lindl. Bot. Reg.* 1844, *sub. tab.* 46.—prostrata: foliis lineari-oblongis, spathulatis, confertis, incano-tomentosis; floribus solitariis, calyce tomento aurantiaco utrinque vestito, laciniis 3-angularibus, erectis, corolla pubescenti, alba.—Chile, Valparaiso.—(*v. s. in herb. Hooker. Cuming, n.* 121. 241. *Bridges, n.* 481. 328.)

This species also grows on maritime rocks, and is distinguished by its longer, broader (in proportion to their length) and more incanous leaves, by its corolla not quite so fleshy and whiter. The leaves are sometimes 13 lines long, and nearly 2 lines broad, densely covered with short white branching almost stellate hairs, the base of the petiole is enlarged, and adheres to the stem by a concave pulvinate gland, which is almost glabrous, and much more conspicuous than in the last mentioned species: the calyx is covered, within and without, by a dense orange coloured tomentum, and its lobes are broader and more triangular.

3. ALIBREXIA? *revoluta*. Nolana revoluta *R. & P.* 2. 8. *tab.* 113. (*male depicta*). Alona revoluta *Lindl. Bot. Mag.* 1844, *p.* 46.—prostrata, incana, stellato-tomentosa, ramulis plurimis succosis; foliis geminis, lanceolatis, spathulatis, carnosulis, margine revolutis; floribus solitariis, axillaribus, cæruleis.—Peruvia, *v. s. in herb. Hooker*: locis maritimis Lurin, *Mathews, n.* 836—837. *Cuming, n.* 1068.

This plant grows on the sandy beach at Lurin in the harbour of Callao, and also in the province of Camana, whence it was sent to Ruiz and Pavon by Tafalla, together with the drawing above cited, which affords a very imperfect representation of the flower: it is quite prostrate, with many short, slender, radiant branchlets which are woody towards the base, fleshy towards the extremity: the leaves are about 1 or $1\frac{1}{4}$ inch long, and about two lines broad, the peduncle is

* A representation of this plant with full details is shown in Plate 12.

about $\frac{1}{2}$ in. long; the calyx is campanular about 4 lines long with 5 equal, 3-angular lobes; the corolla is tubular below, somewhat swollen at base around the disc, above it swells into a somewhat campanular form, with 5 short revolute lobes, it is about an inch long, of a bluish violet colour, pubescent and apparently not marked with the radiate nervures so conspicuous in Nolana and Sorema. The contracted portion of the tube of the corolla is pubescent within, whence the stamens arise, the filaments are dilated, tapering upwards, smooth, and unequal, the anthers are oval, bluish, and included within the mouth: the style is of equal length. The disc has a 10-lobed border, and supports 8 to 12 ovaria. The drupes are fleshy, and vary in size. I found in one case five nuts, each 3-celled, and seven 1-celled—in all twelve nuts with 22 cells: in another instance, I observed three nuts each 4-celled, two 3-celled, one 2-celled, and two 1-celled, in all eight nuts with 22 cells. The whole plant is densely covered with short greyish tomentum, the hairs of which, when magnified, appear sometimes articulate, but most generally stellate and stipitate, a form of pubescence peculiar to this genus. I confess, however, that I feel some hesitation in referring this plant here, as its corolla more nearly approaches that of *Sorema* and *Alona* in size and colour, but in its general aspect, peculiar habit, the size and shape of its leaves densely covered with remarkable tomentum, as well as in the form of its nuts, it greatly resembles the two preceding species.

Grabowskya.

This genus was founded by Prof. Schlechtendahl (Linn. 7. 72) upon the *Ehretia halimifolia* of L'Heretier (Stirp. p. 45. tab. 23). By Linnæus and succeeding Botanists, it was assigned to *Lycium*, without doubt on account of the similarity of its flowers and habit to that genus. Schlechtendahl, for the same reasons, preserved his new genus *Grabowskya* among *Solanaceæ*, but Nees von Esenbeck restored it to *Ehretiaceæ*, because of its unilocular 4-celled ovarium, be-

coming a nut, a character much at variance with the bilocular ovarium with its many seeded placentation on the dissepiment, which is the constant attribute of *Solanaceæ*. Dr. Arnott (Linn. 11. 484) who added 2 new species, supported the views of Schlechtendahl in assigning it a place among *Solanaceæ*, on account of its curved embryo, a view also maintained by Doctor Lindley, who figured a species in the Botanical Register tab. 1985, under the name of *G. Boerhaavifolium*, which I have designated under that of *G. Lindleyi*. Finally, however, Prof. Endlicher in his Genera Plantarum, No. 3745 has again placed it in the albuminous section of *Ehretiaceæ*, a disposition that can hardly be supported, when it is remembered that these have an embryo, either straight, or but slightly curved, broad foliaceous cotyledons, and a small superior radicle, and that they all possess moreover a totally dissimilar habit; *Grabowskya*, on the other hand, has a long, slender, filamentous, and cyclical embryo, with semiterete cotyledons, as long as, and even more slender than the radicle, which points to the base. My own observations lead me to differ somewhat from the views of these distinguished Botanists, and to consider it, as stated in p. 47, rather as forming a subtribe of *Nolanaceæ*, the reasons for which will presently be shown.

Having examined both *G. duplicata* and *G. obtusa* in my last journey across the Cordillera in 1825, I offer the following as an amended character of this genus.

GRABOWSKYA Schlect.—*Calyx* parvus campanulatus, nunc 5-partitus, nunc subinteger, margine mucronibus 5 subulatis extus instructus. *Corolla* hypogyna, infundibuliformis, limbo 5-partito, laciniis patenti-reflexis, æstivatione imbricatis. *Stamina* 5, prope corollæ basin inserta, exserta, filamentis gracilibus, basi villosis, antheris ovatis, bilobis, basi divaricatis, dorso affixis, longitudine dehiscentibus. *Ovaria* 2, adnata, e disco carnoso orta, obovata, singulo 2-loculare, ovulis in loculis solitariis, erectis, angulo interno basali affixis. *Stylus* simplex. *Stigma* clavatum, compressum, sub-bilobum. *Drupa* baccata, calyce parum aucto

suffulta, 2-pyrena, pyrenis osseis, 2-locularibus, loculis 1-spermis, basi perforatis. *Semina* oblongo-obovata, compressa, facie subplana, dorso convexa, testa imo in strophiolam carnosam aucta, apertura basali pertensa. *Embryo* filiformis, intra albumen carnosam cyclicus, radicula tereti ad hilum spectante, subrecta, cotyledonibus semiteretibus, arcuatis.

Frutices *Andicoli vel Bonariensis ramosissimi, spinis axillaribus alternis, Lycii habitu:* folia *alterna, solitaria, vel gemina, aut fasciculata, petiolata:* flores *pedunculati, solitarii vel parce racemosi, aut axillis approximatis paniculam terminalem simulantes.*

1. Grabowskya *Boerhaavifolia* Schlect. *loc. cit. Ehretia halimifolia* L'Herit. *loc. cit. Lycium Boerhaavifolium*, Linn. (non Lindl.) *Lycium heterophyllum* Murray, *in Comment. Gott.* 6. *tab.* 2.—foliis alternis, petiolatis, utrinque attenuatis, petiolo gracili: panicula corymbosa terminali ex ultimis turionibus, pedicellis imo bracteatis, bractea parva lineari acuta: calyce 5-partito, laciniis subulatis, simplicibus, acutis.—Peruvia, *v. s. in herb. Hooker.*

This character is drawn from the description of L'Heritier, which I have compared with a specimen in the herbarium of Sir W. Hooker.

2. Grabowskya *duplicata*, Arn. *loc. cit:* Hook. *Bot. Mag. tab.* 3841: *Ehretia duplicata*, Nees ab Esenb.—foliis longe petiolatis, orbiculari-obovatis, basi cuneatim attenuatis, apice acute ac breviter acuminatis, calyce campanulato, ore subintegro, membranaceo, mucronibus 5, subulatis, infra marginem extus notato, maturescenti fructu parum aucto, tunc dentibus quasi biserialibus, interiori obtuso, exteriori subulato crasso, multoties longiori.—Esquina de Medrano, Provinciæ Cordovensis (a Bonaria 400 m. p. intervallo) mihi detecta: Bonaria (Gillies et Tweedie).

This species has been very faithfully delineated by Sir W. Hooker as above cited, and is remarkable for the peculiar form of its calyx.

3. Grabowskya *obtusa*, Arn. *loc. cit:* *G. Boerhaavifolia* Schlect. *Linn.* 7-72. *Ehretia halimifolia*, Nees ab Esenb: —foliis breviuscule petiolatis, cuneatis, obovato-oblongis, obtusis, calyce 5-partito, laciniis ovalibus, obtusis.—In Cordilleris Andium detexi, altitudine 6000 ped. A Mendozæ desertis retulitque Gillies, altit. 2600 ped.—Vernacule *Uña del Tigre*.

In the form of its calyx and general appearance, this nearly approaches the original species. It is a low growing shrub, with very spinous flexuose branches almost denuded of leaves, the stems being round, smooth, and pallid: the spines generally longer than the internodes are evidently young abortive branchlets, for they often bear leaves, and most frequently flowers, sometimes lengthening and becoming flexuose and prickly: they grow out above the petiolar insertion of each leaf, and there appears on either side of every spine, a young branch, bearing copious alternate leaves; these mostly soon die away, leaving cicatrices on both sides. The leaves are alternate, oblong, almost orbicular at the apex, where there is a slight mucro, they are cuneate at base, terminating in a slender petiole, entire on the margin, and of a pallid glaucous green on both sides. The calyx is tubular, campanulate, somewhat 5-angled at base, the border is divided into 5 short, obtusely angular, erect, very fleshy teeth. The corolla is of a lurid white colour, quite glabrous outside, the tube is slender at base, gradually swelling above, the border is divided into 5 rounded, obovate segments, which overlap in æstivation: inside it is smooth at base, but from one fourth of its length, where the stamens are inserted, to a little below the mouth, it is covered with white woolly pubescence. The stamens rise above the mouth half the length of the tube, the filaments are slender, glabrous above, but in the lower half within the tube, they are very pubescent: the anthers are divaricate at base, and apiculate at the summit. The ovarium is small, obovate, green, smooth, 4-locular, but at a very early period, the existence of 2 distinct bilocular carpels is manifested, a single erect ovule arising

from the base of each cell. The style is erect, simple, somewhat shorter than the stamens. The stigma is clavate, green, with 2 compressed rugose lips. The fruit is a berry with very little pulp, inclosing 2 hard obovate nuts, flat within, rounded outside, each having at the base 2 distinct apertures, which on the inner side extend some way upwards, outside they are separated by a short spine; in this aperture may be seen the strophiole of the seed, by which it receives its nourishment from the fleshy support of the nut: the testa is of a dark green hue, oblong, compressed, smooth, tapering below, exhibiting on the inner flattened side, the before-mentioned protuberant prolongation of the testa: the endopleura is a very thin membrane covering a hard fleshy albumen which encloses the embryo: this is amphitropous and filiform; the radicle which points to the base is terete, a little swollen below; the cotyledons are incumbent, sharply curved at their origin, becoming somewhat straight towards the extremity which closely approaches the end of the radicle.

4. Grabowskya *Lindleyi*: *G. Boerhaavifolia*, Lindl. *Bot. Reg. tab.* 1985:—parce spinosa, frondosa: foliis ovatis, apice acutis, basi in petiolum longum cuneatis: floribus paucis, corolla alba, fauci viridi-venosa, limbo subviolacea.—Rio Grande, Braziliæ meridionalis. (Sellow).

This appears to be a more bushy, and far less spiny species than any of the others, the foliage seems dense, the leaves more elliptic, and the purplish flowers few in each axil, while in the Peruvian species, with which it has been confounded, the flowers are white, and crowded in almost terminal corymbs.

Dr. Walpers (Repert. Bot. Syst. 3. 113) adds 2 other species, but there appears no reason for placing the first (*G. disticha*. Meyen.) in this genus, since the fruit is unknown, and its characters agree quite as well with *Lycium*. The other (*G. Meyeniana* Nees. *Atropa spinosa*, Meyen.) is the plant I have described under the name of *Lycioplesium Meyenianum* (*ante p.* 13.) I am not acquainted with the

Triguiera of Cav. which may probably belong to this tribe.

The evidence given above, in regard to the carpological character of *Grabowskya*, taken into consideration with what I have advanced on a former occasion respecting *Nolanaceæ* (p. 47), renders it clear that this genus cannot appertain either to *Borragineæ*, or to *Nolaneæ*, although it is to this order that it bears the greatest affinity, its position being manifestly between them; with the tribe *Borrageæ* it agrees in the gynobasic origin of its ovaria, and in having a fruit with 2 bilocular nuts, and in the adhesion of the style to the axis of the adnate ovaria, but the form and position of the embryo in copious albumen, independent of its glabrous and totally different habit, forbids any positive connexion with it. On the other hand, the difference between it and *Nolaneæ* is not great: it agrees with them in the form and position of the embryo enveloped in albumen, in its 2-locular nuts, which that tribe often possesses, but it differs in the small and regular number of its ovaria, which in *Nolaneæ* are constantly more numerous, always distinct, and never confluent with the style as in *Grabowskya;* the æstivation of the corolla is also deeply plicate in the one, and imbricate in the other; it agrees, however, as before shown, both with some genera of *Borrageæ,* and all *Nolanaceæ,* in having the cells of its nuts perforated at base, through which a strophiole subtends that connects the testa immediately with the gynobasic disc that supports the ovaria. Upon the whole it appears to offer the closest alliance to *Nolanaceæ,* which order I therefore propose dividing into 2 distinct subtribes, viz :—

Nolanaceæ.

1. *Grabowskyeæ.* Corolla æstivatione imbricata. Ovaria 2, biloculares, stylo unico centrali adnata. Nuces 2, biloculares, loculis 1-spermis, imo perforatis. Semen basi strophiolo instructum. Embryo albumine amplo filiformis, annulari-arcuatus.
2. *Nolaneæ.* Corolla æstivatione contortu-plicata. Ovaria

plurima, stylo unico centrali, distincta. Nuces plurimæ, 1-6 loculares, loculis 1-spermis, imo perforatis. Semen basi strophiolo vario instructum. Embryo albumine amplo filiformis, spiralis.

Thus it is seen that *Grabowskyeæ* stand in relation to *Nolaneæ*, in the same position that *Dichondreæ* do to *Convolvuleæ*, and although the former, in respect to *Solaneæ*, are placed at the two extreme points of the class *Tubuliflorœ* Endl., it cannot be denied that these Orders offer many analogies common to each other, for *Grabowskya* has quite the habit and inflorescence of *Lycium*, and *Nolana* is not very dissimilar in habit from *Physalis*, and other Solanaceous plants; still the carpological characters of the *Nolanaceæ* seems so very distinct, verging evidently towards *Ehretiaceæ*, that there appears to me ample reason for justifying the arrangement above proposed, which also offers the advantage of conciliating the very opposite views of our most distinguished Botanists in regard to these plants.

Metternichia.

This genus was proposed by Dr. Mikan for a beautiful shrub, with large white flowers from the neighbourhood of Rio de Janeiro, and by him dedicated to Prince Metternich, the liberal patron of the many scientific expeditions that have so greatly extended our knowledge of the Natural History of Brazil. It comprises only a single species, of which a very good figure was published by Dr. Mikan in his Delect. Flor. et Faun. Braz. 3, tab. 1, but as that work is extremely scarce, and the details of the seeds not quite perfect, I offer the results of my own observations.

Metternichia, Mik.—*Calyx* campanulatus, tubo inflato, inæqualiter 4-5-6-fido, laciniis 2-3 sæpe duplo majoribus foliiformibus, persistens. *Corolla* hypogyna, infundibuliformis, tubo superne amplo, limbi expansi, æstivatione profunde plicati, laciniis 5, brevibus, æqualibus, crenulato-undulatis. *Stamina* 5, corollæ contractione inserta, inclusa,

2 breviora; *filamenta* filiformia, basi dilatata, imo pubescentes, superne glabra; *antheræ* 2-loculares, basifixæ, longitudinaliter dehiscentes. *Ovarium* sessile, 2-loculare, ovulis in loculis utrinque 8, in septi faciem juxta basin ad nervos 2 parallelos, 2-seriatim dispositis, adscendentibus, imbricatis, inferioribus exterioribus. *Stylus* simplex. *Stigma* 2-lamellatum, laminis, crassiusculis margine revolutis. *Capsula* coriacea, lignosa, cylindracea, 2-locularis, apice septifrage 2-valvis, dissepimento libero, valvis parallelis demum semi-bifidis. *Semina* 2-4 in quoque loculo, e dissepimenti basi adscendentia, longe linearia, utrinque acuminato-attenuata, margine ala membranacea cincta, ventre convexa, dorso carinata, hilo basali, testa chartacea ad endopleuram spongiosam adnata. *Embryo* in axi albuminis carnosi tenui rectus, cotyledonibus linearibus, radiculam cylindricam inferam æquantibus. Arbor *Brasiliensis frondosa,* foliis *alternis breviter petiolatis, ellipticis, penninerviis, valde reticulatis, integerrimis, nitidis,* floribus *terminalibus, subsolitariis, vel plurimis subracemose fasciculatis, ebracteatis, speciosis, albis.*

1. Metternichia *princeps*, Mik. *loc. cit. tab.* 1. Char. ut. supra.—Rio de Janeiro, *v. v.*

This is a handsome tree, or shrub, with copious foliage of bright evergreen leaves and large conspicuous flowers. It is altogether perfectly glabrous. The leaves are about 3-4 inches long, and 1¼ to 1½ in. broad, upon a slender channelled petiole of 4 lines; they are thin, and of a somewhat membranaceous texture, the margin being slightly revolute; they have a reticulated venation, and both surfaces under a strong lens appear minutely punctulated. The calyx is very thin, membranous, light green, very reticulately nerved, and unevenly cleft into 4-5-6 obtuse leaf-like segments of various length; it is generally half an inch, sometimes nearly 1 in. long. The corolla is white, 2½ in. long, 1 in. broad in the mouth, and 2 in. across the border: the tube is slender at base, for about half an inch, when it suddenly swells into a long and somewhat campanular form, marked with many

longitudinal veins: the border is obtusely 5-lobed, and crenulated on the margin, in æstivation it is deeply plicated, the inflected portion being externally covered with soft down, which soon entirely disappears; the stamens are the length of the corolla, the filaments are fixed near the base in the contraction of the tube, which is the only part that is pubescent, they are dilated at the base, and ciliated, but are tapering and glabrous upwards, two of them are somewhat shorter than the others, the anthers are ovate, 2-lobed, somewhat cordate at base, where they are fixed in the sinus to the apex of the filament. The pollen grains are globular, obsoletely 3-gonous, or rather having 3 indistinct mammiform projections at equidistant points, with alternating converging lines. The ovarium is slightly stipitate, obovate, sericeous, 2-celled, with 8 ovules in each cell, arising from the base of the dissepiment, and affixed in 2 series near 2 elevated parallel nerves that extend from the base to the apex of the dissepiment. The style is slender, glabrous, as long as the corolla; the stigma is bilamellated, consisting of two short fleshy lobes, with reflected margins, the inner faces being glutinous and subpapillose. The capsule is $1\frac{1}{4}$ in. long, 4 lines diameter, supported by the persistent calyx, the valves are thick and coriaceous, each being divided half way down the middle; the dissepiment contracts and becomes free as the seeds ripen, sometimes only two or four of which are perfected in each cell, the entire number being seldom matured. The seeds are linear, winged, with a dorsal keel, which is sometimes double; the endopleura adheres to the lining of the cell, which is filled by the albumen: this is cylindrical, 9 lines long, $\frac{3}{4}$ line broad, straight, thin, and fleshy, and encloses an embryo of the same form, with semiterete cotyledons of similar thickness, and about the length of the inferior radicle.*

From the above description, no doubt can any longer exist as to the true position of *Metternichia*, which has

* A figure of this species, exhibiting ample sectional details is given in Plate 14 of this work.

hitherto been considered doubtful. It was placed by Dr. Lindley in *Solaneæ*, near *Solandra*: others have arranged it in *Bignoniaceæ*, and ultimately, on the authority of Fenzl, Dr. Endlicher has doubtfully assigned it a position in the subtribe *Vestieæ*, among *Solanaceæ*. Its true place is certainly next to *Sessea*, with which it agrees in its 2-locular capsule, with the dissepiment parallel to the valves, which are both nearly cleft to the base, in its erect seeds, fixed by their base to the bottom of the dissepiment, and in having a lengthened straight embryo, with linear cotyledons, in which respects it differs from *Vestia*, *Cestrum*, and their congeners. As those two genera exhibit such distinct characters, I propose to arrange them under a separate section, to be called *Metternichieæ*. On examining many of the Solanaceous genera, I have found some among the *Nicotianeæ*, that possess very distinct characters, very closely approaching the *Cestrineæ*, on which account I have ventured to arrange *Fabiana*, and *Nierembergia*, in juxtaposition with them, placing these two genera, because of their capsular fruit, as a separate subtribe, under the name of *Fabianeæ*: as in *Cestrineæ*, they offer, among other features, a bilamellar stigma and a decidedly stipitate ovarium. I also propose to remove *Vestia* from the *Cestrineæ*, and to place it in *Nicotianeæ*, which subtribe I have arranged in the *Rectembryeæ*, for they mostly present an embryo as straight as that of *Cestrum*, together with similar small ovoid cotyledons. The attachment of the seeds in *Cestrineæ* is by a ventral hilum, but in *Nicotiana*, and *Petunia*, the seeds are quite oval, so that it is impossible to say whether the hilum be ventral or marginal: among the *Curvembryeæ*, on the contrary, the seeds are reniform, and compressed, and the hilum always marginal. In a general review of the natural order, *Solanaceæ*, I would therefore propose the following arrangement and division :

SUBORDO I. RECTEMBRYEÆ. Embryo fere rectus. Stigma sub 2-lamellatum, intus papulosum. Ovarium sæpissime stipitatum, rarius sessile.

TRIBUS 1. METTERNICHIEÆ. Embryo elongatus, omnino rectus, teres. Capsula 2-locularis, valvis semifissis: semina pauca, triquetra, alata, hilo basali imo dissepimenti affixa.

Embryo cotyledonibus teretibus, radiculam æquantibus . . . . . 1. *Metternichia.*
„ „ „ „ brevioribus . . . . . 2. *Sessea.*

TRIBUS 2. CESTRINEÆ. Embryo fere rectus, cotyledonibus parvis, ovatis, compressis. Fructus baccatus; semina angulata, hilo ventrali, dissepimenti medio suspensa. Ovarium stipitatum.

Bacca 2-locularis, seminibus paucis . . . . . 3. *Cestrum.*

TRIBUS 3. FABIANEÆ. Embryo fere rectus, subteres, cotyledonibus compressis. Fructus capsularis, 2-locularis, valvis a dissepimento demum solutis. Ovarium stipitatum. Stigma 2-lamellatum.

Capsula valvis 2 profunde 2-fidis, marginibus suturalibus . . . . . 4. *Nierembergia.*
„ „ apice 2-fidis, „ introflexis . . . . . 5. *Fabiana.*

TRIBUS 4. NICOTIANEÆ. Embryo fere rectus, vel lævissime arcuatus, subteres, cotyledonibus brevibus subclavatis. Capsula 2-locularis, valvis a dissepimento demum solutis. Ovarium sessile, plerumque glandula hypogyna suffultum. Stigma capitato-2-lobum.

Capsula valvis 2 profunde 2-fidis, dehiscentia septifragali . . . . . 6. *Vestia.*
„ „ integris „ vix septicidali . . . . . 7. *Petunia.*
„ „ apice 2-fidis, „ profunde septicidali, stamina inclusa, corol. regul. . 8 *Nicotiana.*
„ „ „ „ „ „ „ „ exserta, „ irreg. . 9. *Lehmannia.*
„ „ „ „ „ „ „ „ inclusa, „ obliqua . 10. *Sairanthus.*

SUBORDO II. CURVEMBRYEÆ. Embryo in formam semicircularem, annularem, vel spiralem curvatus. Ovarium sessile vel disco insidens. Stigma capitato-2-lobum, rarissime in laciniis 5 divisum. Semina plurima, hilo submarginali.

TRIBUS 5. DATURÆ. Fructus pseudo-4-locularis.

Capsula muricata . . . . . 11. *Datura.*
„ glabra . . . . . 12. *Dictyocalyx.*
Bacca pulposa . . . . . 13. *Solandra.*

TRIBUS 6. HYOSCYAMEÆ. Capsula circumscissa.

Operculo 2-loculari . . . . . 14. *Hyoscyamus.*
„ 4-valvi, mucronato . . . . . 15. *Anisodus.*
„ 1-loculari . . . . . 16. *Scopolia.*

TRIBUS 7. SOLANEÆ. Bacca 2-locularis. Semina reniformia, hilo marginali.

Before concluding these remarks, I will offer some further observations upon the genera constituting the suborder *Rectembryeæ*, among which I have noticed a feature hitherto unobserved, and although not universal among all the genera, it offers in most cases a very decided character; I allude to the position of the ovarium upon a well-marked and distinct columnar support. In *Petunia* and *Nicotiana* the ovarium is sessile upon an annular disc, which surrounds and conceals this support: in *Petunia* this disc is 2-lobed, in *Nicotiana* it is generally 4-lobed. In *Metternichia* it is sessile,* without any glandular appendage. Among those possessing a stipitate ovarium, *Fabiana* has 2 oblong erect free glands, fixed on the column, while in *Vestia* an annular ring invests the stipes and supports the ovarium. In *Nierembergia*, *Sessea*, and *Cestrum*, (including *Habrothamnus*), the column is simple, quite free, and generally without any glandular appendage, or at least one that is not always easily perceptible. In *Sessea*, *Cestrum*, *Vestia*, *Nierembergia*, and *Petunia*, the tube of the corolla is circumscissile, leaving a persistent cupuliform base that, in some cases, nearly incloses the ovarium, a character I have before pointed out, as existing in some of the *Nolanaceæ*.

I have observed also in the *Rectembryeæ*, that the surface of the testa in the seeds affords a variable character: in *Metternichia* and *Sessea*, it is chartaceous; in *Cestrum*, minutely reticulated and favose; in *Vestia*, broadly rugose, with fine transverse striæ; in *Nierembergia*, with polished prominent rugæ; and in *Fabiana*, it is nearly smooth, with almost imperceptible, longitudinal, rugose striæ. In *Petunia* it is divided into large, equal, hexagonal hollows, separated by simple ridges, while in *Nicotiana* these ridges are waving, crenulate, or even sometimes cristate when viewed by a powerful lens.

The pollen grains of *Metternichia* and *Sessea* are spherical, with 3 rounded mammiform equidistant points, and 3 intermediate convergent lines; those of *Cestrum*, *Fabiana* and

* This, however, is only apparently so, as the column is of the same thickness as the ovarium.

Nierembergia resemble each other, being in the shape of a compressed sphere, somewhat 3-gonous, with a mammiform projection at each angle; those of *Nicotiana* and *Petunia* are of a rounded oblong cylindrical form, with 3 longitudinal grooves, that of *Vestia* being similar, only of a nearly spherical shape.

I have endeavoured to detect some generic distinctions between *Cestrum* and *Habrothamnus*; but after careful investigation, I cannot discover any differential characters either in the flower or the seed: the calyx of the latter is similar to that of many species of *Cestrum*; the corolla is of the same form, its lobes having in like manner a conduplicate æstivation, *i. e.* their edges being turned in on each side for about one sixth of their breadth, and adhering to the adjoining lobes by their woolly surfaces; the stamens are quite similar, as is likewise the style and 2-lamellar stigma; the ovarium, in like manner, is supported upon a short and somewhat glandular column, which when the corolla falls, is invested by its induviate base. I have also examined a capsule yet immature, in which, as in *Cestrum*, the seeds are few, rounded externally, angular within, and attached from a ventral hilum to the thickened placentation of the dissepiment, each by a short ligular strap, and we have the authority of Schlectendahl (Linnea, 8, 251) to show, that the form of its embryo enveloped in albumen is straight, with small round flattened cotyledons; characters which are all exactly those of *Cestrum*. In habit, there is certainly a difference that enables us, at a glance, to distinguish the one from the other, but the real amount of difference is confined to the peculiar kind of articulate pubescence, and the crimson colour of the calyx and corolla; but it must be remembered, that several species of *Cestrum* from Central America, present a calyx and corolla of a deep orange colour, bordering on crimson. If pubescence then be the only tangible character, that can hardly be sufficient to maintain *Habrothamnus*, for in such case, those species of *Cestrum* with stellate hairs, especially those that are hardly distinguishable from *Sessea* in external appearance and in

their flowers, ought also to form a distinct genus, which no one would venture to propose: upon the whole, therefore, I would recommend that the genus *Habrothamnus* be suppressed, and its species arranged as a particular section of *Cestrum* under that appellation.*

I may here avail myself of the opportunity of observing that the genus *Laureria* of Schlechtendahl, placed by some authors among the *Nicotianeæ* is beyond doubt, identical with the *Juanulloa* of Ruiz and Pavon: it ought, therefore to be placed among the *Solaneæ*, where also *Marckea* of Richard, and *Nectouxia* of Kunth, should be arranged, as they better agree with many of that tribe in habit, and as nothing is known of the character of their seeds to warrant their being placed among the *Rectembryeæ*.

I have excluded *Dunalia* from the *Cestrineæ* in the above distribution, because nothing is known of the nature of its embryo, and for other reasons before pointed out, (*ante* p. 13.)

In external aspect there is a remarkable resemblance between some species of *Petunia*, *Nierembergia* and *Salpiglossis*, so much so, that several able Botanists have referred such plants to these three different genera; but there exists in the latter, certain decided characters that cannot be confounded with the two former: I do not allude so much to the didynamous stamens, with a fifth sterile filament, as to the more important one of its deeply reniform seeds, and completely annular, and sometimes even spiral embryo, while in the two former genera the embryo is nearly straight. But there is also another well-marked difference in the æstivation of the corolla, a character of the utmost importance,

* The three known species of *Habrothamnus* thus forming a distinct section of *Cestrum* would be arranged as follows:

§ HABROTHAMNUS.

Cestrum fasciculatum (Habrothamnus fasciculatus, Endl.)
——— Benthami. (——————— tomentosus, Bth.)
——— Endlicheri. (——————— corymbosus, Endl.)

and one that will probably be found to constitute an unerring line of distinction between the *Solanaceæ* and *Scrophularineæ*, orders so closely allied, that our most able Botanists are yet often undecided as to which of the two, certain plants ought to be referred. This is a desideratum of some moment, and one that appears to me worthy of being pursued: it seems to me possible to reconcile all the discrepancies that at first view stand in the way of such a line of demarcation: indeed, there exist many singular analogies between some plants of the *Salpiglossideæ*, and other *Scrophularineous* genera, and some of tribes of the *Solanaceæ* as above defined, which will probably assist us in this inquiry, but I will reserve to a future opportunity the exposition of my sentiments on this subject, in order to have more ample means of examining the characters of these plants, and of availing myself of the assistance that will be afforded by the extensive views, and vast collection of facts, made by the learned author of the monograph of the *Scrophularineæ*, in the forthcoming volume of the Prodromus.

Sessea.

In order to confirm what I have before stated respecting the affinities of *Metternichia*, I will offer a few observations upon the genus *Sessea* of Ruiz and Pavon, two species of which are only recorded, both being well figured by the authors of the Flora Peruviana; but as I have also had an opportunity of examining two other undescribed species existing in the splendid herbarium of Sir William Hooker, and as the characters of the seed have not been yet sufficiently well determined, I venture to propose here an amended definition of the genus and a description of the four species.

Sessea, R. & P. (Char. emend.)—*Calyx* tubulosus, 5-dentatus. *Corolla* hypogyna, infundibuliformi-tubulosa, limbi 5-fidi erecto-patenti laciniis ovatis, æstivatione conduplicatis. *Stamina* 5, tubi medio corollæ inserta, inclusa;

antheræ 2-lobæ, profunde cordatæ, basifixæ, lobis ovatis, longitudinaliter dehiscentibus. *Ovarium* ovatum, breviter stipitatum, cyatho (corollæ reliquo) circumsessum, 2-loculare, ovulis in loculis utrinque, in septi juxta basin 2-serialiter dispositis, adscendentibus, imbricatis, inferioribus exterioribus. *Stylus* simplex. *Stigma* inæqualiter 2-lamellatum, lobo inferiori breviori, subdeflexo, altero erecto. *Capsula* coriacea, cylindrica, subarcuata, calyce stipata, 2-locularis, apice septifrage 2-valvis, dissepimento libero, valvis parallelis, demum semibifidis. *Semina* pauca, imbricata, lineari-oblonga, compressa, margine ala membranacea cincta, ventre convexa, dorso carinata. *Embryo* in axi albuminis carnosi tenui rectus, cotyledonibus linearibus, subcompressis, radiculam cylindraceam inferam medio æquantibus.—Frutices *Peruviani et Nova Granatenses*, foliis *alternis*, *petiolatis*, *oblongis*, *pseudo-stipulatis*, *integerrimis*, *infra sæpissime tomentosis*; racemis *terminalibus*, *paniculatis*, calyce corollaque *sæpius stellato-tomentosis*.

1. Sessea *stipulata*, R. & P. *Flor. Peruv.* 2, 9, *tab.* 115 *b*.—Frutex fœtidus, orgyalis; foliis lanceolatis, acuminatis, cordatis, supra glabriusculis, subtus stellato-tomentosis, ferrugineo-incanis; pseudo-stipulis magnis, auriculæformibus, gibbosis, deciduis, racemis alaribus terminalibusque, pedicellis corymbosis.—Peruvia, *v. s.*—in herb. meo.

The branches are glabrous, compressed, and finely striated. The leaves are about $4\frac{1}{2}$ in. long, $2\frac{1}{4}$ broad, on a petiole 9 lin. long, channelled and tomentous, the internodes being about $1\frac{1}{2}$ in. apart. The stem of the axile raceme exhibits sometimes a few small leaves, but it is generally bare for the length of 3 inches, when it spreads into a close branching tomentous panicle of flowers; the terminal peduncles are shorter, closer, and more branched, forming a thyrsoid panicle; the pedicels have each a linear, very acute, leaf-like bract, cuneate at base, and tapering into a long slender petiole. The calyx is 3 lin. long, tubular, 5-toothed; the tube of the corolla above the calyx is funnel-shaped, about 7 lin. long, and the border is divided to the mouth into five

equal oblong segments of the length of 2 lines, with deep inflected æstivation; both the calyx and corolla are smooth nside, and are covered on the outside with dense stellate tomentum. The stamens are included, the filaments rise from about the middle of the tube, out of as many prominent longitudinal ridges, which are retrorsely pilose, they are quite smooth above; the anthers are deeply cordate, 2-lobed, fixed on the apex of the filament, the lobes being oval and slightly scabrid. The pollen grains are spherical 3-grooved, with alternating convergent lines. The ovarium is ovate, very sericeous, surmounted on a distinct glabrous stipes, which is surrounded by a short tubular cup, being a persistent portion of the corolla, which here breaks off by a horizontal line as I have described in *Alibrexia*, a feature I find to be apparent in nearly all the species hitherto placed in the *Cestrineæ* that I have examined. The style is columnar, erect, sulcated, slightly but distinctly scabrid in its entire length, and is longer than the corolla; the stigma is bilabiate, the upper lip being erect and longer than the other, which is somewhat declined. The capsule is curved, cylindrical, 4-grooved, about double the length of the persistent calyx, smooth, bursting by four nearly equal fissures that extend half way down. They usually contain two or four seeds in each cell, imbricate in two series; they are oblong, compressed, winged and keeled, much in the same manner as in *Metternichia*, only smaller and broader in proportion; the cavity containing the embryo is about 2 lines long, $\frac{3}{4}$line broad, the inner membrane remains attached as a lining to the cavity, the albumen, which entirely fills the cell, is thin and fleshy, and encloses an embryo of the same cylindrical shape; this is nearly straight, slightly sigmoid in one direction, and a little curved in the other, the cotyledons are not broader than the radicle, are semiterete and somewhat compressed, and are about half the length of the inferior radicle.*

2. Sessea *dependens*, R. & P., *Flor. Peruv.* 2, 9, *tab.* 116.—

* This species, with details, is shown in Plate 15.

Arbor 5-orgyalis: ramis pendulis: foliis sparsis petiolatis cordato-oblongis, acutis, integerrimis, subtus valde pulverulentis; pseudo-stipulis nullis: racemis longissimis, terminalibus, dependentibus, floribus ternis sessilibus.—Tarma, Peruviæ, *v. s. in Herb. Mus. Brit.*

The specimens collected by Dombey, and Ruiz and Pavon, existing in the British Museum, greatly resemble the figure given in the Flora Peruviana: the stem is flexuose, much compressed, and finally glabrous; the leaves are smooth above, pulverulent beneath, with soft stellate hairs; the capsules are twice the length of those of the former species, and half enclosed in the persistent calyx, which is finally quite glabrous.

3. Sessea *vestita*. *Cestrum vestitum*, Hook. Icon. pl. tab. 381.—Frutex, ramulis compressis demum glabris: foliis oblongis, acutis, basi obtusis, petiolatis, nervis sub 8-jugis, venisque reticulatis superne impressis, supra glabris, subtus petiolis ramulis corymbisque tomento incano vel subfulvo dense vestitis, pilis apice stellatis vel articulatis et plumosis; pseudo-stipulis nullis; corymbis terminalibus densifloris; corollæ tubo gracili fulvo-tomentoso; ovario tomento stellato dense vestito; capsula glabra subincurva.—Nova Granada, *v. s. in Herb. Hooker.* Paramo de Quindiù, (*Goudot.*) Quito, Pichincha et Tambillo, (*Jameson, n.* 185 *et* 67.)

This is described as a tree of middle size, growing at an elevation of about 9000 feet above the level of the sea. The leaves are from $3\frac{1}{2}$ to $4\frac{1}{2}$ in. long, $1\frac{1}{2}$ to 2 in. broad, on a petiole 6 lines in length; they are shining above, quite glabrous, with impressed reticulate veins, which give the older leaves a very rugous appearance. The flowers, peduncles and branchlets are covered with very dense incanous or fulvous down, the hairs of which are stellate at the apex, but on the under side of the leaves, this tomentum consists of hairs composed of many short joints, which are stellate at each articulation, so that they appear elegantly plumose. The corymbs are much branched and densely flowered, the whole being covered with close fulvous

tomentum; the calyx is obconical, truncated, with five prominent nervures, and as many almost obsolete teeth, and is 1½ line long; the corolla is 8 lines long, with a very slender funnel-shaped tube, nearly smooth within, the border consists of five short erect lobes, which have a conduplicate æstivation; the stamens arise somewhat below the middle of the tube, are a little geniculate, and slighty pubescent at base, slender, straight, and glabrous above, and recurved at the apex; the anthers are included, with ovate adnate lobes, which are attached at a dorsal point to the apex of the filament. The ovarium is fixed on a distinct glabrous column equal to its own length; it is oval, densely covered with white stellate hairs, and is somewhat umbilicate at the apex, out of which rises a long slender glabrous style, somewhat longer than the stamens; the stigma is 2-lamellate. The capsule is cylindrical, 4-grooved, somewhat incurved, and half invested by the persistent calyx, is 6 lines long and 1 line diameter, splits into two valves, which are 2-fid at the apex; the seeds are small and winged, as in the first described species.

4. Sessea *corymbosa*, (n. sp.)—Frutex, omnino glaberrimus, ramulis subcompressis; foliis approximatis, petiolatis, cuneato-oblongis, supra lucidis, subtus pallidioribus, glandulis minutis creberrimis albis notatis, pinnato-nerviis, nervis primariis divaricatis, 16-20 jugis cum alteris intermediis brevioribus, reticulato-venosis, pseudo-stipulis nullis: racemis corymbosis terminalibus, floribus sessilibus.—Nova Granada, *v. s. in Herb. Hooker*, Bogota ad Barro Blanco, (*Goudot*), S. *corymbosa*, MSS.

This species differs from all the preceding in being wholly free from any pubescence, except externally on the inflected portion of the lobes of the corolla. The leaves are smooth above, of a clear dead green colour; the nerves and reticulated veins are prominent; beneath, they have a somewhat ferrugineous hue, but under a lens the lower surface is very closely covered with minute white glandular raised dots; their length is 5 inches, their breadth 1½ to 2 inches, upon a petiole ¾ in. long, which is thick and rounded below, some-

what flattened above, and of a glaucous hue. The flowers are sessile, and arranged in a branching few-flowered corymb; the calyx is 3 lines long, the corolla 8 lines in length, funnel-shaped, about 2 lines in diameter, with five rather short, erect teeth; the filaments, of unequal length, are fixed below the middle of the tube, have a few recurved hairs at base, but are glabrous above; the ovarium, which rises on a short glandular column, is glabrous, as well as the long, slender, and slightly incurved style; the stigma is somewhat larger, 2-lipped, and inclined; the capsule is shorter and thicker than in the preceding species, being half invested by the persistent calyx, about 6 lines long, 2 lines in diameter, and somewhat curved; there are two seeds matured in each cell, which are broadly winged, with a slender longitudinal keel. The form of the embryo corresponds with that of the first described species.

Cestrum.

During my residence in Rio de Janeiro, I found in its neighbourhood and in the Organ Mountains, several species of *Cestrum*; and as I do not find them recorded, I will here offer a short diagnosis of their characters. In order to explain the views before proposed, in regard to the distribution of the *Rectembryeæ*, and as a term of comparison between this genus and others included in this sub-order, I will first give a somewhat amended character, in accordance with observations made upon several species that I examined in the living state.

Cestrum, Linn. (char. emendat.)—*Calyx* parvus, tubulosus, 5-fidus, vel 5-dentatus, persistens. *Corolla* hypogyna, infundibuliformis, tubo elongato, superne ampliato, limbo 5-partito, patenti vel revoluto, æstivatione conduplicativo. *Stamina* 5, medio corollæ tubo inserta, inclusa, filamentis simplicibus, vel basi dente auctis, antheris longitudinaliter dehiscentibus. *Ovarium* ovatum, breviter stipitatum, stipite vix glanduloso cyatho (corollæ reliquo) circumdato,

2-loculare, dissepimento medio placentifero, ovulis paucis, spermadermis ligulatis suspensis. *Stylus* simplex. *Stigma* sub-2-lobum, vel concavo-capitatum. *Bacca* calyce suffulta, 2-locularis, vel abortu 1-locularis. *Semina* pauca, compressa, dorso rotundata, facie interna angulata, hilo ventrali. *Embryo* in axi albuminis carnosi rectus, cotyledonibus parvis, orbiculatis, compressis, radicula tereti infera.—Frutices *Americæ tropicæ*, foliis *alternis*, *solitariis rarius geminis*, *integerrimis*, *interdum pseudo-stipulatis*; floribus *racemosis*; racemis *bracteatis*, *axillaribus*, *elongatis*, *vel in corymbum*, *spicam*, *aut fasciculam abbreviatis*; floribus *sæpe suaveolentibus*, corollis *luteis*, *rarius viridescenti-albidis*, *aurantiacis vel rubris*; baccis *nigris aut violascentibus*.

The following are the new species above alluded to.

1. Cestrum *Organense* (n. sp.)—glaberrimum, ramulis teretibus; foliis ellipticis, utrinque acuminatis, submembranaceis, in petiolum basi tumidum subdecurrentibus; racemis axillaribus, floribus subcapitatis, bracteis foliosis magnis oblongis sessilibus, corollæ fere longitudine; staminibus insertione barbatis, edentulis.—Rio de Janeiro, Serra Organensi, *v. v.*

This species approaches *Cestrum bracteatum*, (Link et Otto, Pl. Select. 1. tab. 6. Bot. Mag. 2974), but its leaves are neither lanceolate nor pubescent, nor have they any pseudo-stipules: they are 5 in. long, $1\frac{3}{4}$ broad, on a petiole 6 to 8 lines in length. The peduncles of the racemes are from 2 to 3 in. long: the bracts are 6 lines long, 4 lines broad, with ciliate margins; the calyx is glabrous, tubular, 1 line long, with 5 short, erect, ciliolate teeth: the corolla with a very slender tube, swollen below the mouth, is 9 lines long, with a rotate border, the margins of the lobes externally are tomentous for one-third of their breadth on each side, which are turned in during æstivation, so that they adhere together by these broad woolly surfaces: the included stamens are inserted above the middle of the tube, and arise out of as many tufts of spreading hairs, the anthers are rounded, 2-lobed,

and somewhat scabrid: the pollen is compressed, 3-gonous, with a small rounded lobe at each angle, from which 3 convergent lines meet in the centre: the ovarium is supported upon a short, distinct, but somewhat slender column, which in many species is somewhat glandular, and this is surrounded by the persistent base of the corolla, which invariably breaks off as it falls, by a horizontal line, leaving a cylindrical cup: the ovarium is divided into 2 cells by a dissepiment, which presents in its centre a thickened placentation, and upon this are suspended, by a short ligular strap, upon their ventral faces, a small number of ovaria in each cell: the style is filamentous, glabrous, and of the length of the tube of the corolla: the stigma is capitate, being formed of 2 lamellar lobes, whose inner surfaces are covered with a thick green glutinous exudation: the berry is oval, scarcely fleshy, and each cell presents 4 ripened seeds: these are somewhat obovate, rounded on the outside, and angular on the inner face, a little above the centre of which is the hilum, from which the seed is suspended by its short ligular strap: the testa is of a dark green colour, of very soft texture when fully ripe: the albumen is soft and fleshy, in the centre of which is seen the erect embryo, which is white, and as in most other *Cestrineæ*, lays longitudinally across the hilum, the cotyledons are small, flat, and rounded, two-thirds of the length and twice the breadth of the terete radicle, which points towards the bottom of the seed.*

2. Cestrum *lanceolatum* (n. sp.)—ramulis teretibus virgatis, foliis elongato-lanceolatis, acuminatis, margine subundulatis, revolutis, basi rotundatis, apice mucronatis, utrinque glabris, breviter petiolatis; racemis axillaribus, brevibus, paucifloris.—Rio de Janeiro, Serra Organensi. *v. v.*

The leaves are 4 in. long, 8 lines broad, on a caniculate petiole, 3 lines in length: they have no pseudo-stipules. The racemes are 9 lines long, which I found only in seed: the

* A representation of this species, with detailed sections, is shown in Plate 16.

berry is oblong, contracted below, supported on a calyx apparently but little enlarged, and contains 2 or 3 seeds in each cell; the seeds correspond with those of the last species.

3. Cestrum *collinum* (n. sp.)—ramulis compressis junioribus angulatis, tomentosis: foliis lanceolatis, basi rotundatis, apice acuminatis, apiculatis, supra nitidis, subtus stellato-pulverulentis, petiolatis: paniculis terminalibus, vel racemis axillaribus, abbreviatis, subumbellato-capitatis, pedunculis calycibusque tomentosis, baccis pisiformibus.—Rio de Janeiro, Corcovado. *v. v.*

The leaves of this species are 5 in. long, and $1\frac{1}{4}$ in. broad, on a petiole 5 lines long, which is swollen at base.

4. Cestrum *Corcovadense* (n. sp.)—ramulis teretibus: foliis ellipticis, utrinque sub-attenuatis, glaberrimis, petiolo gracili basi tumido, pseudo-stipulis sessilibus, inæquilateris: racemis axillaribus brevissimis, floribus subcapitatis, staminibus edentulis, inclusis, insertione villosis: baccis pisiformibus.—Rio de Janeiro, Monte Corcovado. *v. v.*

The leaves are of thin texture, with numerous reticulate veins, 8 in. long, $3\frac{3}{4}$ in. broad, on a petiole 1 in. long: the pseudo-stipules are 9 lin. long, 4 lin. broad: the racemes are only 9 lines long, the corolla with a very smooth tube is 9 lines long, the lobes of the border being deeply turned in, where in æstivation the margins adhere by these broad tomentous edges, the stamens are one-third the length of the corolla.

5. Cestrum *mucronatum* (n. sp.)—ramulis subcompressis; foliis petiolatis, exstipulatis, ellipticis, utrinque glabris et viridescentibus, apice valde attenuatis, calloque apiculatis, marginibus subrevolutis et crassioribus; racemis axillaribus, geminis, compositis; baccis oblongis.—Brasiliæ, Prov. Rio de Janeiro, ad Freixal. *v. v.*

The leaves of this species are 4 in. long and $1\frac{1}{4}$ in. broad, on a canicular petiole, 6 lines long; the racemes are from $1\frac{1}{2}$ to $3\frac{1}{2}$ in. long; the calyx is campanular, 5-toothed, with ciliate margins.

6. Cestrum *montanum* (n. sp.)—glaberrimum, ramulis teretibus, virgatis, superne subangulatis; foliis lineari-lanceolatis, valde acuminatis, petiolatis, pseudo-stipulis foliosis; racemis axillaribus, compositis, pedunculo, pedicellisque compressis, apice tumidis, bracteis linearibus, caducissimis, staminibus inclusis, filamentis tenuibus, dente parvo munitis.—Brasilia, in montibus Organensibus. *v. v.*

The leaves are $4\frac{1}{2}$ in. long and 11 lines broad, with 14 pairs of divaricate nervures, on a slender petiole, 6 lin. long; the pseudo-stipules are spathulately ovate, 5 lines long, 3 lin. broad; the racemes are 2 in. long, and the pedicels 3 lines. The calyx is tubular, 1 line long, 5-toothed, with ciliate margins, the tube of the corolla is slender, 8 lin. long, swollen at the mouth, the border is expanded with lanceolate lobes and tomentous plicate edges, the filaments, one-third of its length, being inserted above the middle of the tube; the stigma is cup-shaped, hollow, somewhat 2-lobed, and exserted; the bracts are 2 lin. long, and very soon fall away.

7. Cestrum *coriaceum* (n. sp.)—ramulis teretibus, furfuraceis; foliis lanceolato-ellipticis, coriaceis, superne nitidis, subtus glaucis, rugosis, marginibus subrevolutis, petiolo crasso, caniculato, pseudo-stipulis nullis, floribus paucis axillaribus, vix racemosis, subfasciculatis, bracteis linearibus, staminibus edentulis, inclusis, medio corollæ insertis, filamentis glabris, basi hirsutis.—Minas Geraes Brasiliæ. *v. s. in herb. meo, et Herb. Hooker,* (*Gardner, n.* 1786, *et Claussen.*)

This is very distinct from C. *corymbosum* in its much larger and more coriaceous leaves and longer petiole, in its axillary flowers, in the insertion of the stamens, and other characters. It differs also from C. *laurifolium* in the size of its leaves, and its edentulate stamens. The leaves are very thick and opaque, 9 in. long and $3\frac{3}{4}$ in. broad, on a petiole 9 lin. long. The peduncle of the raceme is barely 3 lines in length, few-flowered, with linear bracts, 1 line long. The calyx is campanulate, glabrous, 5-toothed, $1\frac{1}{2}$ line long, the

tube of the corolla is funnel-shaped, smooth, 6 lines long, the induplicate margins of the lobes being tomentous in æstivation, but afterwards quite smooth.

Fabiana.

This genus was first proposed by the authors of the Flora Peruv. for a small sea-side shrub of almost ericaceous habit, with erect terminal solitary flowers. Another species, likewise of Chilean growth, is enumerated in the Botany of Beechy's Voyage; and a third is recorded by St. Hilaire, from the southernmost province of Brazil. To these I have now to add a fourth species, which I collected in the Paramillo of Mendoza, in 1825. This genus by most authors has been placed in the sub-tribe *Nicotianeæ*; Lindley, however, in his Introd. Nat. Syst. p. 296, has arranged it in *Cestrineæ*, I believe, on the authority of Bentham; I can fully confirm this disposition, for reasons founded on its carpological characters, (*ante*, p. 147). Having seen the typical species. as well as the plant above alluded to, in the living state, and collected it in seed, I am provided with data sufficient to justify the following reformation of its generic features.

Fabiana, R. et P. *Prod.* 22, *tab.* 34.—*Calyx* tubulosus, inæqualiter quinquefidus, lobis linearibus obtusis, persistens. *Corolla* hypogyna, subhypocrateriformis, tubo sensim ampliato, limbo plicato, reflexo, breviter 5-lobo. *Stamina* 5, imo corollæ inserta, inclusa, inæquilonga, apice incurva, antheris cordato-2-lobis, longitudinaliter dehiscentibus. *Ovarium* breviter stipitatum, glandulis 2 hypogynis liberis carnosis munitum, multiovulatum, placentis sub-lamellatis dissepimento adnatis. *Stylus* simplex, apice incrassato-curvatus. *Stigma* 2-lobum, obliquum, lamellis incrassatis. *Capsula* calyce stipata, 2-locularis, septicido-2-valvis, valvis apice 2-fidis, margine utrinque septiferis, introflexis, columna placentari compressa, libera. *Semina* plurima, minima, ovata, facie interna angulata, hilo ventrali. *Em-*

bryo intra albumen carnosum fere rectus, cotyledonibus oblongis, compressis, radicula infera, tereti, vix latioribus, et duplo brevioribus.—Fruticuli *Austro-Americani, viscosi, vel resinosi*; foliis *alternis, sparsis, vel imbricatis*; pedunculis, *extra-axillaribus, vel terminalibus, solitariis, unifloris.*

1. Fabiana *imbricata*, R. et P. *Flor. Per.* 2. 12, *tab.* 122 c. *Hooker, Icon. Pl. tab.* 340. *Lind. Bot. Reg. n. s.* 12. *tab.* 59. —Chile in paludosis maritimis, vernacule *Pichi. v. v.*
2. Fabiana *viscosa*, Hook. et Arn. *loc. cit.* 36.—Chile ad Barasca, vernacule *Pichinilla.*
3. Fabiana *thymifolia*, St. Hil. *Mem. Mus.* 12, 317, *tab.* 9. *Pl. Remarq. Bres.* 220, *tab.* 20.—Rio Grande do Sul, Braziliæ.
4. Fabiana *denudata* (n. sp.)—fruticosa, resinoso-glutinosa, virgato-ramulosa, ramulis flexuosis angulatis fere aphyllis: foliis valde deciduis, alternis, minimis, lineari-spathulatis, obtusis, carnosis: floribus terminalibus, solitariis, bracteatis, breviter pedunculatis, erectis.—In Andibus Mendocinis (Paramillo). *v. v.*

This is a dry, arid-looking shrub, that I found growing on the Paramillo of Mendoza, in January, 1825; it is about 3 or 4 feet high, almost leafless, with numerous, erect, virgate, very flexuose branchlets, which are angular, resinous, and somewhat glutinous, with internodes about $\frac{1}{4}$in. apart; the leaves are extremely deciduous, very minute, linear, scarcely more than a line in length, and extremely narrow. The flowers are smaller than those of F. *imbricata*, solitary, erect and terminal, upon the younger branchlets. The calyx is tubular, 3 lines long, with 5 erect linear teeth one third of its length; the corolla is tubular, slender, a little swollen at base, rather funnel-shaped in the mouth, 9 lines long, of a yellowish-white colour, quite glabrous, with a 5-lobed border, the segments being short, rounded, and reflected. The filaments are slender, arising from the base of the corolla, to which they adhere for a short distance, being somewhat dilated at base, they are nearly the ength of the tube, 3 being somewhat shorter, they are sud-

denly reflected a little below the apex, and terminate in a short pulvinate connective, to which the 2 anther lobes are attached, these being somewhat divaricate at base. The pollen (like that of *Cestrum Organense*), is compressed, trigonous, with a small rounded lobe at each angle, from which 3 convergent lines meet in the centre. The ovarium is obovate, shining, stipitate, and invested at base by a free fleshy disc, consisting of 2 broad lobes, arising from the stipes: (in F. *imbricata* these lobes are narrow, opposite, quite separate, and erect). The style is filiform, as long as the stamens, incurved towards the summit, where it is considerably thickened; the stigma is thick, clavate, oblique, with two rather reflected lamellar lips. The capsule is cylindrical, about 5 lines long, and $1\frac{1}{2}$ line diameter, invested at base by the persistent calyx; it splits into 2 valves, the margins of which are deeply introflected, and the summit of each valve is cleft about one-fourth of its length: the placentary column is placed transversely with the valves, and shows a number of small projections arranged in longitudinal series, which have been the points of attachment of the seeds. The seeds are numerous and small, oval, rounded on the dorsal side, and angular on the ventral face, the hilum being here situated a little above the middle. The embryo placed in the centre of fleshy albumen is linear, almost straight, or very slightly sigmoid, the radicle is terete, with cotyledons one-fourth of its length, which are equal to it in breadth, and slightly compressed.*

I may here remark, that the *Fabiana lanuginosa*, Hook. Arn. *Bot. Beechy's Voyage* 35, is the *Dolia vermiculata*, Lindl. (*ante* p. 55). As the plants collected in that expedition offered no specimen in seed, there was every reason for considering it to be a *Fabiana*, the flower and the habit of which it so much resembles, rather than the type of a new genus among the *Nolanaceæ*.

* A representation of this plant with full generic details is shown in Plate 17.

PLATE XVII.

Exhibits a drawing of *Fabiana denudata*. *Fig.* 1, Calyx and pistil; *Fig.* 2, corolla, *both nat. size*; *Fig.* 3, calyx with bractiform leaflet; *Fig.* 4, corolla; *Fig.* 5, calyx, one half removed, to show the stipitate ovarium upon its glandular disc, with its style and stigma; *Fig.* 6, corolla cut open; *Fig.* 7, stamens before bursting; *Fig.* 8, stamens after dehiscence; *Fig.* 9, pollen; *Fig.* 10, stigma; *Fig.* 11, capsule, with persistent calyx; *Fig.* 12, capsule with half of calyx removed, to show the persistent gland and stipes; *Fig.* 13, transverse section of capsule, with seeds removed from one of the cells, to show placenta; *Fig.* 14, capsule after dehiscence; *Fig.* 15, valves separated, to show inflected margins; *Fig* 16, placentæ, seen front and sideway; *Fig.* 17, seeds in different positions: *Fig.* 18, longitudinal section of seed; *Fig.* 19, embryo: *all much magnified.*

PLATE XVIII.

A presents a figure of *Nierembergia rivularis*. *Fig.* 1, the corolla in bud; *Fig.* 2, transverse section of ditto, to show the mode of æstivation; *Fig.* 3, border expanded, seen from above: *all nat. size*; *Fig.* 4, stamens in bud, removed to show the mode in which they are embraced by the stigma;

Fig. 5, stamens seen in front and from behind, before and after dehiscence; *Fig.* 6, stigma seen sideways; *Fig.* 7, stigma seen in front, with a portion of the style removed, to show the position of the stigma, in regard to the cells of the ovarium; *Fig.* 8, stigma seen from behind: *all magnified.*

B shows *Nierembergia hippomanica.* *Fig.* 1, a flower, *nat. size*; *Fig.* 2, the calyx; *Fig.* 3, the corolla; *Fig.* 4, the corolla cut open; *Fig.* 5, the stamens embraced by the stigma: *all magnified*; *Fig.* 6, the anthers, before and after dehiscence: *more highly magnified*; *Fig.* 7, the calyx half removed, to show the pistil, with the base of ovarium encircled by the persistent cup of the corolla; *Fig.* 8, the pistil with the stigma expanded: *all magnified*; *Fig.* 9, capsule with the persistent calyx: *nat. size*; *Fig.* 10, ditto, *magnified*; *Fig.* 11, the capsule removed, to show its manner of dehiscence; *Fig.* 12, the persistent cup of the corolla removed; *Fig.* 13, a transverse section of the capsule: *all magnified*; *Fig.* 14, some of the seeds: *nat. size*; *Fig.* 15, a seed: *magnified*; *Fig.* 16. a seed seen sideways; *Fig.* 17, a longitudinal section of ditto; *Fig.* 18, the embryo extracted from the albumen and seen sideways; *Fig.* 19, front view of ditto; *Fig.* 20, a leaf: *all much magnified.*

PLATE XIX.

A is *Nierembergia stricta.*

B is *Nierembergia rigida.* *Fig.* 1, a calyx; *Fig.* 2, a corolla; *Fig.* 3, a corolla cut open; *Fig.* 4, the stamens removed; *Fig.* 5, the pistil seen sideways and in front: *all natural size.*

PLATE XX.

A exhibits *Nierembergia linifolia.* *Fig.* 1, the corolla cut open; *Fig.* 2, the pistil, with the stamens removed and embraced by the stigma; *Fig.* 3, the stamens; *Fig.* 4, the pistil with the stigma expanded: *all nat. size.*

B shows *Nierembergia anomala.* *Fig.* 1, a flower: *nat. size*; *Fig.* 2, a flower cut open: *magnified*; *Fig.* 3, the pistil, showing the stigma embracing the stamens; *Fig.* 4, stamens seen in different positions before dehiscence: *more highly magnified*; *Fig.* 5, the pistil separated, and seen in front and sideways: *magnified.*

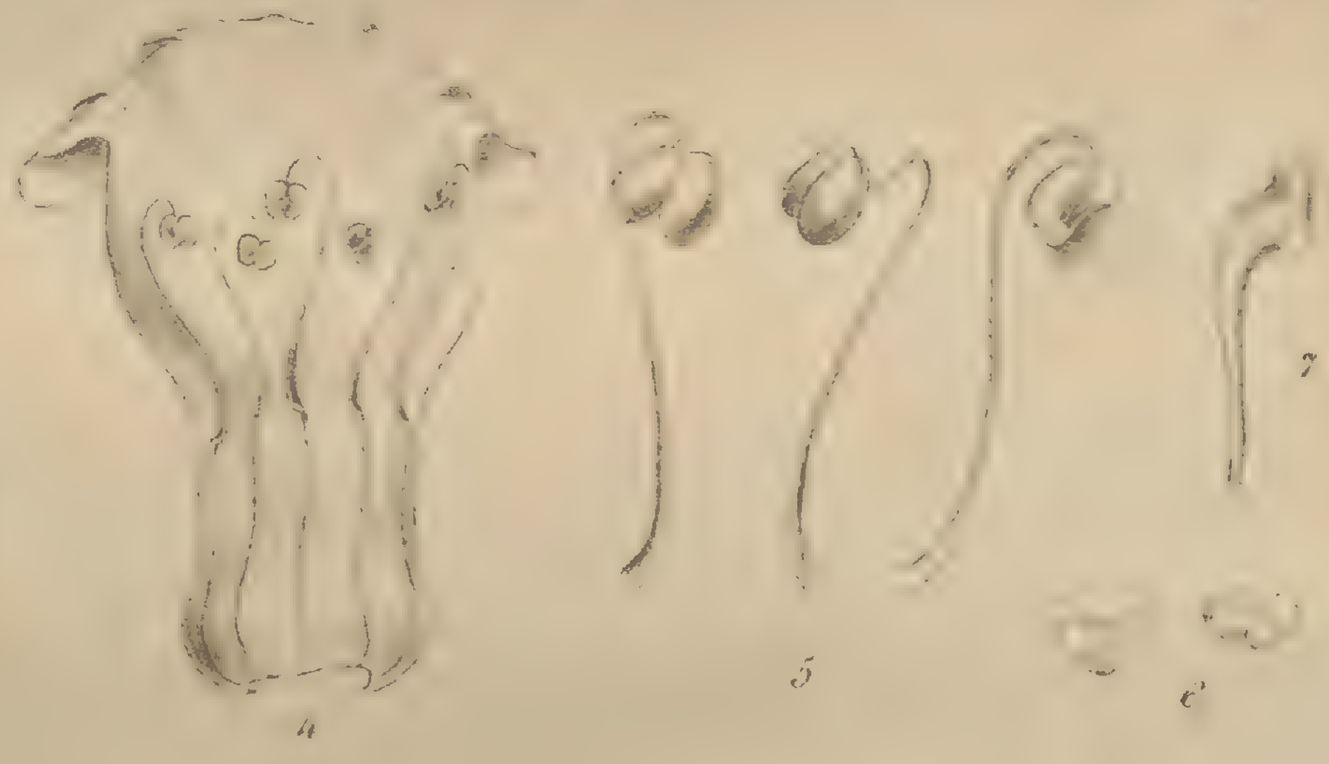
PLATE XXI.

Shows *Vestia lycioides.* *Fig.* 1, a flower; *Fig.* 2, the calyx; *Fig.* 3, the corolla cut open; *Fig.* 4, a section through the lobes of the corolla in bud, to show the mode of æstivation: *all nat. size*; *Fig.* 5, an anther, before and after dehiscence: *magnified*; *Fig.* 6, grains of pollen, *highly magnified*:

Fig. 7, the calyx with the front portion removed, showing the stipitate pistillum: *nat. size*; *Fig.* 8, the stigma; *Fig.* 9, a longitudinal section of the lower portion of the calyx, showing the half of the persistent stipitate remains of the corolla, and the ovarium seated on its stipitate 4-lobed glandular disc: *both magnified*: *Fig.* 10, the capsule after dehiscence, inverted by its persistent calyx; *Fig.* 11, a transverse section of ditto; *Fig.* 12, the dissepiment with its thickened placenta bearing the seeds, detached from the valves; *Fig.* 13, seeds: *all nat. size*; *Fig.* 14, a longitudinal section of a seed in two directions; *Fig.* 15, the embryo extracted from the albumen, seen in front and sideways, and a case of most rare occurrence with three cotyledons: *all much magnified.*

PLATE XXII.

Gives a figure of *Nicotiana cirrhoides.* *Fig.* 1, the corolla cut open; *Fig.* 2, the calyx and pistil; *Fig.* 3, ditto with the calyx cut open and thrown back: *all nat. size*; *Fig.* 4, the stigma; *Fig.* 5, the ovarium seated on its 4-lobed glandular disc, with the calyx cut away: *both magnified*; *Fig.* 6, the capsule after dehiscence, invested by its persistent calyx; *Fig.* 7, seeds: *both nat. size*; *Fig.* 8, a seed, seen side and edgeways: *magnified*; *Fig.* 9, longitudinal section of ditto; *Fig.* 10, section of albumen; *Fig.* 11, the embryo extracted; *more highly magnified.*



J.Miers lithog.

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Fabiana denudata.

Nierembergia rivularis.

Mers lithog

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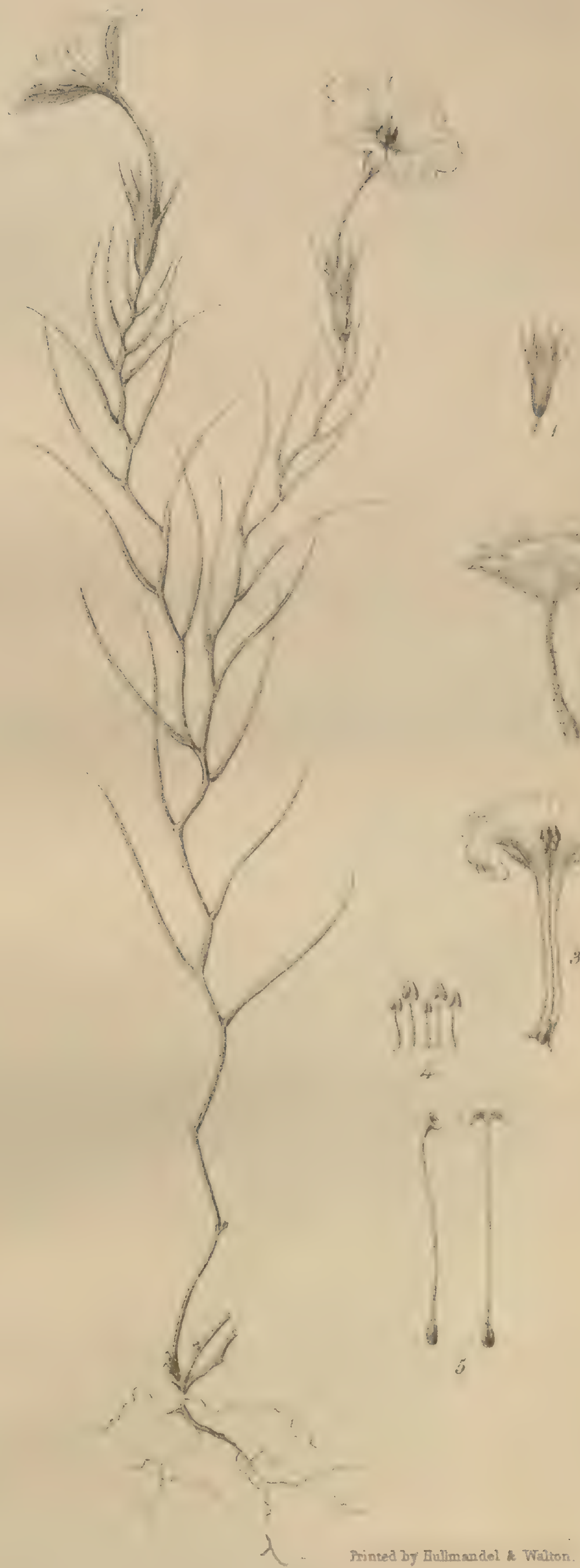
Nierembergia hippomanica

Nierembergia stricta.



Nierembergia rigida.

J. Miers lithog.

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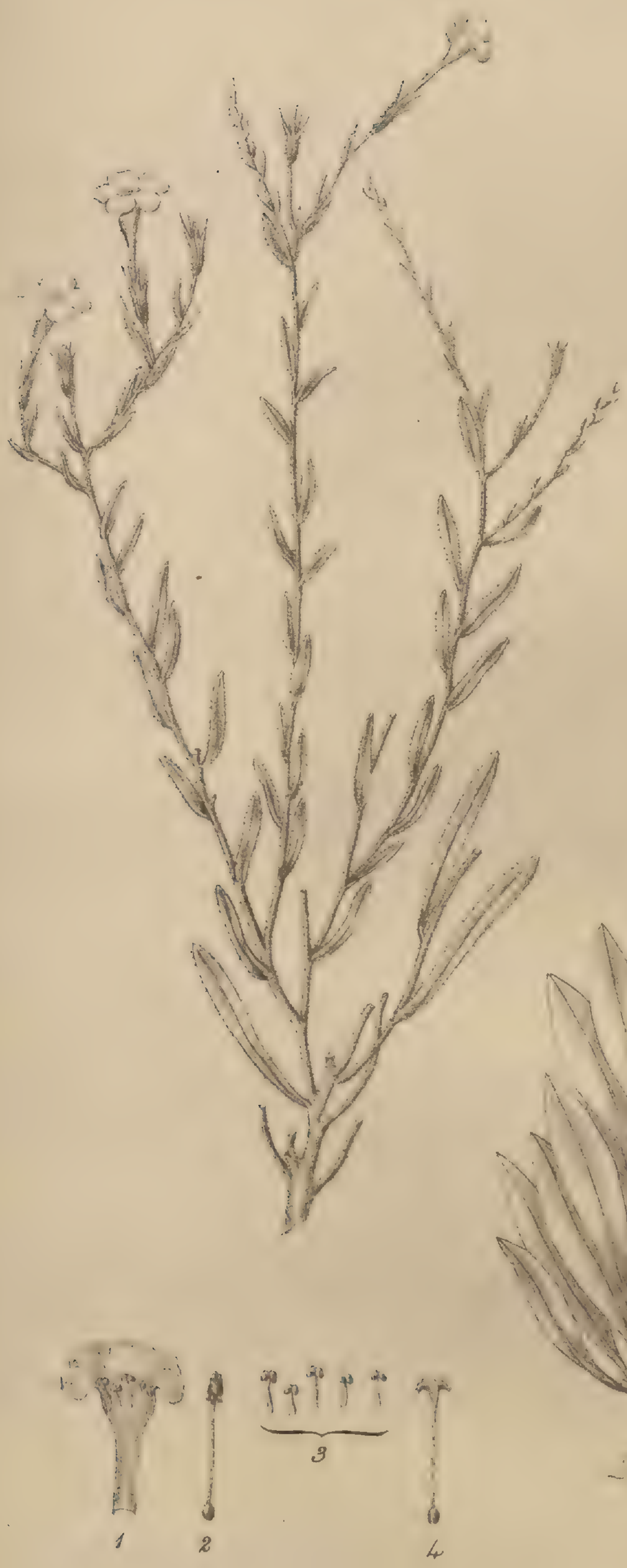

J. Miers lithog.

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Nierembergia linifolia.

Nierembergia anomala.

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ILLUSTRATIONS

OF

SOUTH AMERICAN PLANTS.

BY

JOHN MIERS, F.R.S. F.L.S., &c.

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Nierembergia.

I have already offered some reasons (p. 71) for showing why this genus, hitherto considered as belonging to *Nicotianeæ*, should be separated from that sub-tribe. Several species are now cultivated in England, so that it is not requisite to enter into any particular details, but it is essential to define the exact limits of this genus, especially as much resemblance exists between several of its species and some kinds of *Petunia* and *Nicotiana*, which often renders it difficult, from mere external form, to determine to which of these three genera they should be referred. It is, however, distinguished by having the divisions of the calyx usually acute and rigid, not foliaceous; the tube of the corolla is usually very elongated, and more slender than in the *Petunoid* section of *Nicotiana*, though it sometimes approaches in form to some of the smaller flowering *Petunias*; the stamens are generally inserted in the mouth of the corolla, rarely in the middle of the tube; but its most prominent characteristic, is that of the peculiar form of the stigma, which is in the shape of an inverted crescent, with its horns curved round in front, embracing the anthers within its grasp; the capsule also differs from that of the two genera above-mentioned, by having its valves scarcely, if at all, introflexed. I have already pointed out the difference in its stipitate ovarium, and in the form of its pollen grains, in which respects, and in its distinctly bilamellar stigma, it affords a close approximation to *Fabiana*. In order to remove the doubts that may exist in regard to the several species of this genus, I will offer a short enumeration of each, with the more striking characters, as far as I have been able to observe them, and will add some new species that I met with in 1825, together with a few others, yet undescribed, that exist in the herbarium of Sir Wm. Hooker; I propose to amend the generic character in accordance with these observations, in the following manner.

Nierembergia, R. et P.—*Calyx* tubulosus, 10-costatus, semi 5-fidus, laciniis linearibus, subinæqualibus, acuminatis. *Co-*

rolla hypogyna, tubulosa, tubo gracili, elongato, rarius subinfundibuliformi, ore campanulato, limbo amplo, expanso, breviter 5-lobo, lobis rotundatis, æstivatione plicato. *Stamina* 5, corollæ fauci, rarius medio inserta, exserta, rarissime inclusa, inæquilonga, circa stylum conniventia; antheris longitudinaliter dehiscentibus, stigmate circumplexis. *Ovarium* breviter stipitatum, 2-loculare, placentis dissepimento adnatis, multiovulatis, cyatho (corollæ reliquo) demum circumdatum. *Stylus* simplex. *Stigma* sublaterale, oblunato-bilamellatum, lamellis reflexis. *Capsula* calyce persistente tecta, 2-locularis, septicide 2-valvis, valvis introflexis demum 2-partitis, dissepimento placentari libero. *Semina* plurima, minima, ovata, facie interna angulata, hilo ventrali. *Embryo* intra albumen carnosum fere rectus, cotyledonibus oblongis, compressis, radicula infera tereti vix latioribus, et longitudine æquantibus.—Herbæ *Austro-Americanæ procumbentes vel radicantes, vix suffruticulosæ*, foliis *alternis solitariis v. geminis integerrimis*, floribus *extra-axillaribus vel oppositifoliis, solitariis, subsessilibus, albis vel violascentibus.*

1. Nierembergia *repens*, R. et P. *Fl. Per.* 2, 13, *tab.* 123 c.—caule basi repente, ramulis erectis filiformibus; foliis subfasciculatis, oblongis, pilosulis; floribus subsessilibus, calyce curvato, tubuloso, lobis obtusiusculis.—Chile ad Conceptionem.—*v. s. in Herb. Hook.* (*Cuming.* n. 135.)

The leaves in the specimens I have seen are ovate, about 5 lines long, 3 lines broad, on a short petiole of 2 lines, they are thinly covered with short pubescence; the calyx is about 3 lines long, also pubescent; the corolla is white, with a long slender tube, about an inch in length, and a broad campanulate border, nearly 9 lines diameter, divided into 5 rather short, rounded lobes, each of which is marked with 3 purple longitudinal lines, the throat being of a yellowish colour.

2. Nierembergia *spathulata*, H. B. K. *nov. gen. sp.* 3, 8.—caule lignoso repente, fibrillis tuberoso-nodosis; ramulis erectis filiformibus puberulis; foliis solitariis vel geminis elliptico-spathulatis, longe petiolatis, glabris margine ciliolatis, junioribus lanuginoso-pubescentibus; calyce subsessili

curvato, tubuloso, pulverulento-tomentoso, laciniis obtusis. —Nova Granada, ad Santa Fe de Bogota et Loxam; altit. 6-8000 ped. *v. s. in Herb. Hook.* (Bogota, *Goudot.*)

The leaves are nearly glabrous, or slightly ciliolate, the blade elliptic, 6 lines long, 3 lines broad, on a petiole of 6 lines. The calyx is 4 lines long, the tube of the corolla 8 lines long, the border being more tubular and narrower in the mouth than the former species, and much less in diameter.

3. Nierembergia *calycina*, Hook. *Bot. Mag. tab.* 3371.—caule repente, filiformi, ramulis procumbentibus, foliisque alternis v. geminis, obovatis, petiolatis, hirto-pubescentibus, pilis canis divaricatis; pedunculis solitariis, brevibus, extra-axillaribus; calyce magno, tubuloso-campanulato, laciniis obovatis, foliaceis, expansis; corollæ tubo longissimo.—In Andibus, prope Mendozam. *v. s. in Herb. Hooker.*

This species is very distinct from the two former, the axils are more distant, the leaves generally in pairs, obovate, suddenly acuminate at each end, 9 lines long, 5-6 lines broad, on a short petiole of 2 lines, they are hirsutulate, with long, white, spreading, adpressed hairs; the peduncles 9 to 11 lines long; the calyx about 9 lines long, is tubular at base, for the length of 3 lines, the lobes being broad, foliaceous, obovato-spathulate, slightly apiculate, with a row of long spreading hairs on each side of the mid-rib; the tube of the corolla is extremely slender, 2 inches long, the border broadly campanulate, 1½ in. diameter, with 5 rounded lobes, the throat and tube being of a yellowish hue.

4. Nierembergia *rivularis* (n. sp.)—caule repente, filiformi, ramulis procumbentibus, foliisque longissime petiolatis, spathulato-ovatis glabris; floribus solitariis subsessilibus, oppositifoliis; calyce curvato, laciniis oblongis, subobtusis, erectis; corollæ tubo valde elongato, glabro.—Buenos Ayres. *v. v.*

I found this plant on the grassy banks of the Rio de la Plata, the prostrate branches creeping among the grass, above which rise its pretty white flowers. The leaves are alternate, more rarely geminate, quite glabrous, the blade is from 9 to

12 lines long, 4 to 6 lines broad, elliptic, somewhat obtuse at summit, cuneate at base, on a slender petiole $1\frac{1}{4}$ long. The flower is solitary upon a short horizontal peduncle, 1 line long; the calyx is curved and slightly pubescent, 10-nerved, 4 lines long, with unequal, oblong and somewhat obtuse segments; the corolla is glabrous, with a very slender tube, $2\frac{1}{4}$ inches long, $\frac{1}{4}$ line thick, its border is broadly campanulate, nearly an inch in diameter, with 5 short rounded lobes; the stamens are exserted, fixed in the extreme edge of the tube, quite smooth.

5. Nierembergia *hippomanica* (n. sp.)—*Trav. Chile.* 2, 532.—Planta scabrido-pilosa, caule lignoso, humifuso, radicante; ramulis brevibus adscendentibus; foliis confertis, spathulato-linearibus, acuminatis, calloso-mucronatis; floribus, parvis, subpaniculatis; calyce brevi, 10-carinato, lobis linearibus, patulis; corollæ tubo gracili, brevi, calyce 2-plo longiori, glanduloso-pubescenti, limbo late campanulato, lobis rotundatis.—Provincias Argentinas, vernacule *Chuchu. v. v.*

a. foliis confertis, lanceolato-linearibus, valde approximatis, scabrido-pilosis. In Prov. Cordovæ et San Ludov.

β. foliis glaucis, glabriusculis, brevibus, anguste linearibus. Achiras.

This is a low-growing species, disseminated in certain pasturage districts within the Provinces of San Luiz and Cordova, and is said by the Gauchos to be very poisonous to horses. The root is much thicker, more tortuous and woody than the former species, creeping along the surface of the ground, and throwing up several woody erect branching stems, 4 to 6 inches high, which are clothed with close-set foliage. The leaves are 4 lines long, $\frac{3}{4}$ lin. broad, linear, and spathulate, covered with dense scabrid hairs. The peduncles are 1 line long, the calyx 2 lines, the tube of the corolla 3 to 4 lines long, with a broad campanulate border, 5 lines diameter, and is of a white colour, tinged with a rosy hue.*

* A representation of this species is shown in Plate 18 of this work.

6. Nierembergia *ericoides* (n. sp.)—caule adscendente, ramulis erectis virgatis; foliis brevibus sub-fasciculatis, breviter linearibus, obtusis, carnosulis, scabrido-pilosis, calyce 10-costato, costis hirsutulis.—Banda oriental. (*Tweedie, v. s. in Herb. Hooker*).

This species approaches the last, but is very different in habit, being much branched, with straight virgate stems, and growing to the height of 12 to 18 inches, whereas the other seldom exceeds 3 to 6 inches in height, is tortuous and greatly stunted. The leaves are fasciculate, much more fleshy, more scabrid, and the axils are more diffuse. The flowers are covered with simple, not glandular pubescence, are much larger, and the tube of the corolla is longer in proportion to the calyx; the leaves are sessile, about 3 lin. long, and barely a line broad; the calyx is covered with long hairs, and is 2 to 3 lines long, on a peduncle of 2 lines; the tube of the corolla is 5 lines long, and the broadly campanulate border is from 6 to 8 lines in diameter, and of a white colour; the capsule is small and ovate.

7. Nierembergia *gracilis*, Hook. *Bot. Mag. tab.* 3108. *Sweet. Fl. Gard. 2 ser. tab.* 172;—caulibus strictis, erectis, herbaceis, foliisque spathulato-linearibus, pubescentibus, axillis superioribus alternis, inferioribus subverticillatis, internodiis brevibus; floribus in ramulis junioribus terminalibus, calyce tubuloso 10-costato, inter costas membranaceo, laciniis linearibus, obtusis, corollæ tubo calyce multo longiori, limbi campanulati lobis rotundatis. — Bonaria et Prov. Argent. (Pampas.) *v. s. in Herb. Hooker.*

This is a far more erect and slender species than N. *hippomanica*, its stems being of a less woody texture: its leaves are not fasciculate as in the two preceding species, but are simple, very linear, about 7 lines long, and 1 line broad, sometimes smaller. It is a well known plant in our gardens, where, however, its habit is still more slender, its stems weaker, and more prostrate than in its native growth.

8. Nierembergia *filicaulis*, Lindl. *Bot. Reg. tab.* 1649. *Bot. Mag. tab.* 3370. *Sweet. Fl. Gard. 2 ser. tab.* 243;—caule herbaceo, erecto, filiformi, ramulis subflexuosis foliisque

lineari-lanceolatis, vagis, glabris; pedunculis oppositifoliis, solitariis, calycis laciniis acuminatis, corollæ tubo gracili calyce vix longiori, filamentisque glanduloso-pubescentibus, limbo magno, campanulato, lilacino, fauce luteo.—Bonaria, *v. s. in Herb. Hooker*. Rio Parana, (*Tweedie*). Entre-Rios, (*Tweedie*) n. 284. Rio Grande do Sul (*Isabelle*).

Its native place is erroneously stated in most botanical works, to be Mexico. The leaves are 12 to 14 lines long, 1½ line broad, somewhat spathulate at base, a little obtuse at summit, with rather distant internodes. The calyx is 10-nerved, the nervures being covered with short pruinose tomentum, is 6 lines long, cleft half way down into 5 subequal, linear, obtuse segments. The tube of the corolla to the extremity of the calyx is slender, above which, for an equal length, it swells into a broadly campanular form, the border about 1½ inch diameter, being expanded and divided for half its breadth into 5 subequal short rounded lobes; it is slightly pubescent outside, of a lilac colour marked with purplish lines.

9. Nierembergia *angustifolia*, HBK. *Nov. Gen.* 3, 9, *tab.* 198: —caulibus herbaceis, cæspitosis, erectiusculis; foliis sessilibus, lineari-lanceolatis, glabris, pedunculis oppositifoliis, solitariis; calycis laciniis longe linearibus, acutis, corollæ tubo elongato, glabro, limbo campanulato, lobis brevissimis, rotundatis.—Mexico.

This species much resembles the last in habit, the leaves 8 lines long, 1 lin. broad, are spathulate at the base. The peduncle is 2 lines, the calyx 5 lines, the tube being scarcely more than 1 line in length, the segments narrow and spreading; the tube of the corolla is 6 lines long, and the white campanular border, 5 lines in diameter. In the figure above quoted, the filaments are represented as united into a tube, and the stigma funnel-shaped, but these are probably errors of the draughtsman, being quite at variance with all the other species.

10. Nierembergia *aristata*, Sweet, *Fl. Gard.* 2 *ser. tab.* 255; glabriuscula, caulibus lignosis, erectis, valde ramosis, gra-

cile filiformibus: foliis spathulato linearibus, obtusiusculis, calloso-mucronatis, calyce urceolato tubuloso, 10-costato, inter costas membranaceis, laciniis æqualibus lanceolato-acuminatis, calloso-aristatis, subpatulis; corollæ tubo gracili, glanduloso-pubescenti, limbo late campanulato, lobis amplis rotundatis; capsula ovata, calyce aucta inclusa.—Provincias Argentinas. *v. v.*

I met with this species at Encrucijada, in the Province of San Luiz, and in Buenos Ayres, in which last place it was also found by Tweedie, from whom the seeds cultivated in England were obtained; from the former locality, the branches are stronger, and more ligneous; but shorter, more branched, and more herbaceous from the latter. The leaves are $\frac{3}{4}$ to 1 inch long, 1 line broad, almost glabrous, the internodes measuring 4 lines: the peduncle is of the length of the axil, 4 lines, opposite the leaf, and flexuosely divaricate with the stem, which is, however, quite straight below; the calyx, almost glabrous, is 4 lines long, cleft half way down into 5 spreading rigid lobes, the tube of the corolla is extremely slender, 6 lines long, the border being about $\frac{5}{8}$ inch diameter, it is white, with longitudinal striated purple lines. The capsule is about 4 lines long and sub-4-valved.

11. Nierembergia *stricta*, (n. sp.) — glabriuscula, caulibus simplicibus, lignosis, erectis, gracillimis, strictis: foliis spathulato-linearibus, acuminatis, calloso-mucronatis, eveniis, utrinque glabris, margine sub-ciliatis: pedunculis oppositifoliis; calyce 10-costato glabro, costis ciliatis, laciniis spathulato-lanceolatis, aristatis, erectis, inæqualibus, tubo 3plo-longioribus, corollæ tubo valde elongato, glanduloso-pubescenti, calyce 3-4plo longiori, limbo late campanulato, lobis brevissimis rotundatis.—Buenos Ayres, *v. s. in herb. meo.*

This plant may be only a variety of N. *aristata*, but it certainly differs from it in having very slender simple stems with more distant internodes, and only 1 or 2 terminal flowers; its calyx has shorter, broader, and more erect segments, and the corolla is larger, with a far more elongated

tube: the leaves are 1 inch to 14, or even 20 lines long, 1½-2 lines broad, the internodes being 5 to 9 lines distant; the peduncle is 3 lines, the calyx 7 lines long, obsoletely 10-ribbed, the segments are 5 lines in length, the space between the ribs not being white and membranaceous as in the former species: the tube of the corolla is extremely slender, 1½-2 in. long, the border measuring 10 lines in diameter.*

12. Nierembergia *rigida* (n. sp.) *Trav. Chile.* 2.532;—glaberrima, caulibus ramosis erectis, valde flexuosis, filiformibus, striatulis: foliis angustissime linearibus, 3-costatis, mucronato-aristatis: pedunculis solitariis, brevibus, oppositifoliis, calyce 10-costato, laciniis linearibus, rigidis, aristatis, tubo 3-plo longioribus; corollæ tubo gracili, pubescenti, limbo late campanulato, lobis rotundatis.—In Prov. Argentinis et Andibus Mendosinis: Rio Negro (Patagonica), *Tweedie*, *v. v. et s. in herb. Hook.*

I found this very distinct species at Punta de Agua and Achiras, in the Province of Cordova, about 550 miles from Buenos Ayres: it was met with in the Pampas by Dr. Gillies, who also collected it in the Cordillera of Mendoza. The stems, which arise from a long slender ligneous root, are from 6 to 8 inches high, very filiform, extremely flexuose, with internodes 3 lines distant: the very rigid leaves are 15 lines long, not more than one sixth of a line broad, and somewhat falcate and spreading: the peduncle is 3 lines in length; the calyx, 6 or 7 lines long, is furnished with very short and almost glandular white pubescence, the tube being only 2 lines, has 10 very prominent ribs, and 5 rigid linear segments, nearly a line broad, tapering gradually to a sharp point, each 3-nerved: the tube of the corolla is 9 lines long, with a white campanular border, nearly an inch in diameter, having 5 oblong rounded lobes, with purple longitudinal lines; the stamens, fixed in the mouth of the tube, are slightly pubescent.†

* A figure of this species is given in Plate 19 of this Work.

† This species is represented in Plate 19.

13. Nierembergia *pinifolia* (n. sp.); — caule adscendente lignoso, inferne denudato, ramulisque delapsu foliorum, cicatricosis, apice foliiferis; foliis imbricato-confertis, erectis, linearibus, 3-costatis, apice mucronatis, calyceque rigido 10-costato glanduloso-pubescentibus; corolla violascenti.—Brasilia meridionali, (Prov. Rio Grande do Sul.) *v. s. in herb. Hooker.*

The leaves are closely imbricated at the summit of the branchlets, nearly erect, and closely imbricated, 11 lines long, $\frac{2}{3}$ line broad, the calyx is 8 lines long, cleft half way down into 5 equal lanceolate rigid segments, the tube of the corolla is scarcely longer than the calyx, and the campanular border $\frac{3}{4}$ inch diameter, of a lilac hue, is marked with longitudinal purple lines.

14. Nierembergia *pulchella* (n. sp.);—caulibus adscendentibus; foliis lineari-lanceolatis, utrinque acutis, margine apiceque incrassatis, subpubescentibus: calyce subinflato, 10-nervi, pilosulo; corolla profunde violacea, puberula, tubo gracili, calyce paulo longiori, limbo late campanulato, staminibus inæqualibus.—Cordillera de los Andes, ora orientali. *v. s. in herb. Hook.* (*Gillies MSS.* N. *pulchella.*)

The leaves are 11 lines long, on a petiole of 2 lines, and $1\frac{1}{2}$ line broad; the calyx is 5 lines long, cleft half way into 5 linear, acuminate, erect segments, it swells in fruit to the length of 7 lines, the tube becoming nearly globular, $2\frac{1}{2}$ lines in diameter, the tube of the corolla is 6 lines in length, the border campanulate, 5 lines in diameter, and of a deep purple colour.

15. Nierembergia *cærulea* (n sp.);—caulibus adscendentibus, pubescentibus; foliis parvis, anguste linearibus, fere fasciculatis, erectiusculis, falcatis, demum glabris; corolla violacea.—Punta del Sauce, Prov. Cordovæ. *v. s. in herb. Hooker.* (*Gillies MSS.* N. *cærulea.*)

The leaves are 6-7 lines long. $\frac{1}{3}$ lin. broad, the calyx 3 lines long, cleft half way in 5 equal, linear, somewhat reflexed segments, on a peduncle of 2 lines: the tube of the corolla

is slender, 6 lines long, with a border broadly campanulate, 8 lines in diameter, divided into 5 short rounded segments.

16. Nierembergia *pubescens*, Spr.—N. graveolens, *St. Hil. Pl. rem. Bres.* 221, tab. 21, A.—caule lignoso, diffuso: foliis oblongo-linearibus, utrinque acuminatis, glanduloso-pilosiusculis.—Montevideo.

The above figure shows the leaves to be 10 lines long, 2 lines broad, the calyx 7 lines long, cleft half way into 5 lanceolate erect segments, the tube of the corolla 10 lines long and slender, the border broadly campanulate, 6 lines diameter.

17. Nierembergia *linifolia* (n. sp.); —glanduloso-scabrida, caule lignoso, e basi ramuloso, ramis virgatis, rectiusculis; foliis sessilibus, lanceolato-linearibus, apice callosis; pedunculis oppositifoliis, bracteatis, calyce brevi 2-3-plo longioribus; istius lobis linearibus aristatis; corollæ tubo infundibuliformi, limbo parvo expanso, 5-lobo: staminibus inclusis.—In Prov. Argentinis. *v. v.*

α. internodiis longioribus, foliis majoribus pallidis, erectis, floribus subflexuoso racemosis.—Mendosa, *in herb. meo et Hook.* Petunia (*Mendozinensis, Gillies MSS.*)

β. internodiis brevioribus, foliis divaricatis, floribus subsolitariis.—Prov. Cordovæ. *In herb. meo et Hook.* (Nicotiana *linoides, Gillies MSS.*)

Both varieties of this species, which I found in the places quoted, in 1826, bear much the appearance of a *Linum* in habit. It is distinct from all others belonging to the same genus, in the greater length of its peduncle, in its corolla having a much thicker and more infundibuliform tube, with its stamens included altogether within its mouth, and a narrow border cleft to its base, into oblong reflected segments, in which respects it more nearly resembles *Fabiana*. In the var. α, the leaves are 4 to 9 lines long, 1 line broad, the internodes 6 to 10 lines distant: in var. β. the leaves are 4-6 lines long, $\frac{1}{2}$ to 1 line broad, the internodes 3 lines apart: the peduncle is 7 lines long; the calyx 3 lines, cleft deeply into 5 linear erect segments; the tube of the corolla is 6 lines long,

slender at base, swelling gradually towards the mouth, where it is 1½ line broad, the border only 3 lines in diameter, consisting of 5 short expanded oblong rounded lobes.*

18. Nierembergia *anomala* (n. sp.);—glabriuscula, suffruticulosa: caulibus plurimis ramosis adscendentibus: foliis radicalibus longissime, caulinis breviter petiolatis, oblongo-lanceolatis, utrinque attenuatis, crassiusculis, eveniis, fere glabris, sparse pilosiusculis, junioribus linearibus, floribusque glanduloso-pilosis, pilis sæpissime scabridis patentibus dense tectis; floribus paucis, longe pedunculatis; corollæ tubo infundibuliformi, calyce fere duplo longiori, fauce amplo, limbi 5-fidi lobis parvis rotundatis expansis.—Provincias Argentinas. *v. v.* in Prov. Cordovæ. *v. s. in Herb. Hook.* Prov. Cordovæ (*Gillies, Nicotiana breviflora, MSS.*)—Monte Video et Cordova (*Tweedie, No.* 1122).—Texas ad San Felipe (*Drummond, 3rd Coll.* 245).—Chile ad Quillota (*Bertero. sec. Colla.*)

I first saw this plant in May 1826, at Frayle Muerto and Zanjon in the province of Cordova, at a distance of 360 miles from Buenos Ayres, and it was afterwards found by Gillies and Tweedie in the same province, but their specimens are of more slender growth, the stems more virgate and herbaceous, the leaves more distant, narrower, more pubescent and glaucous than the plants I met with, which in habit closely resemble those collected in Texas. The root is repent, knotty and woody, throwing out several erect shoots at intervals, which are from 6 inches to a foot in height: the radical leaves have a slender petiole as long as the blade, being altogether 2½ inches long, and 4 lines broad, the cauline leaves have a petiole scarcely a line in length, and are from 10 to 16 lines long, about the length of the internodes, and are 2 to 5 lines broad, veinless, erect, and together with the stem, are almost glabrous, the younger leaves and branches are, however, covered more or less densely, with short, rigid, spreading, and glutinous

* A representation of this species is shown in Plate 20.

hairs, the floral leaves being linear, narrow, scarcely more than 4 lines long. The flowers are axillary, the peduncle being 8 lines long, lengthening in fruit to 18 lines: the calyx as well as the peduncle is densely covered with short very spreading rigid hairs, somewhat glutinous, it is 3 lines long, tubular, 10-nerved, and divided half way down into 5 unequal, thickened, linear, obtuse, erect segments; the corolla is of a whitish, sometimes of a yellowish colour, slightly pubescent outside, 5 lines long, quite infundibuliform, marked with 15 longitudinal purplish veins, is enlarged in the mouth, and has a very narrow border of 5 short spreading rounded lobes: the filaments are dilated, fixed in the middle of the tube: the ovarium is oblong and smooth: the style is erect, smooth, as long as the corolla: the stigma is lunulate, or deeply reniform, expanded and embracing the anthers within its encircling rounded lobes: the capsule is smooth, and of the length of the incanescent persistent calyx.*

This plant, it may be presumed, is widely disseminated, for I can discover no difference between the specimens from Texas, and those I found in the Pampas of Buenos Ayres, either in their inflorescence, their leaves, or their habit, except that from the latter place the pubescence is short, rigid, widely spreading, and viscid at the tips, while from the former, it is longer, soft, adpressed, and quite free from glandular viscidity; but this is not sufficient to constitute a specific difference.

The plant collected at Quillota in Chile and described and figured by Colla, (*Memorie di Torino*, 38, 135, *tab.* 45), as my *Petunia viscosa*,† is evidently the same species.

* This species with sectional details is exhibited in Plate 20.

† The plant enumerated by me under this name (Trav. Chile, 2. 531) is that subsequently named by Prof. Graham, *Nicotiana* (Petunioides) *acuminata*.

Species dubia.

19. Nierembergia? *nana.* Nicotiana nana, *Lindl. Hort. Trans.* 6, 92. *Bot. Reg. tab.* 833.—Planta acaulis, cæspitosa; foliis confertis, lanceolatis, longe spathulatis, pilosis, floribus multo longioribus; pedunculis 1 floribus, calyce turbinato, glutinoso-piloso, lobis obtusis, corollæ tubo calyce 2-plo longiori, pilosulo.—Oregon, Rocky Mountains, *v. s. in Herb. Hook.*

This plant in no way resembles any species of *Nicotiana*, and as stated by Dr. Lindley, it is difficult to account for its having been confounded, with *N. multivalvis*; in habit it greatly resembles the four first species of *Nierembergia* above enumerated, but a better knowledge of the structure of its flower, is wanting to point out its true position. The only specimen I have seen, exists in the herbarium of Sir Wm. Hooker, and that is entirely destitute of inflorescence.

Vestia.

This genus consists only of a single well-known species, long since described by many authors, and figured in the Flora Peruviana, under the name of *Periphragmos fœtidus*. I find, however, many of these recorded features at variance with what I have seen, more especially in the figure alluded to, where the structure of the capsule and the seed, is very inaccurately given. The following is an outline of its generic character, according to my own observations.

Vestia Wild. (Char. emendat.)—*Calyx* campanulato-tubulosus, breviter 5-dentatus, dentibus apiculatis, demum auctus et capsulam suffulciens. *Corolla* hypogyna, infundibuliformi-tubulosa, basi demum circumscissa, limbi 5-fidi lobis æqualibus ovatis, æstivatione conduplicatis. *Stamina* 5, paulo supra basin in contractionem corollæ adnata, exserta; *filamenta* e glandula crassa dense barbata orta,

basi dilatata, superne filiformia, glabra; *antheræ* cordatæ, ovatæ, basifixæ, longitudinaliter dehiscentes. *Ovarium* ovatum, breviter stipitatum, disco annulari crenato striato sessum, cyatho persistente (corollæ reliquo) demum clausum, 2-loculare, ovulis plurimis, dissepimento utrinque adnatis. *Stylus* simplex, exsertus. *Stigma* incrassatum, lamellis 2 carnosis agglutinatis. *Capsula* ovata, 2-locularis, 2-valvis, valvis fere 2-fidis, dissepimento demum libero medio placentifero parallelis, incrassato. *Semina* plurima, angulato-ovata, sinu ventrali excavata, hinc supra medium hilo parvo notata, testa tuberculata, striatulis transversis reticulatis signata. *Embryo* in axi albuminis carnosi fere omnino rectus, cotyledonibus 2, rarissime 3, parvis, subcompressis, radicula tereti infera sub-latioribus, et 3-plo brevioribus.—Frutex Chilensis *erectus ramosus*, Cestri *facies*; foliis *alternis, petiolatis, integerrimis, glabris*; floribus *e summis alis subracemosis*, pedicellis *medio articulatis et hinc bractea foliosa decidua instructis, nutantibus.*

1. Vestia *lycioides*, Wild. Cantua ligustrifolia, *Juss.* Cantua fœtida, *Pers.* Periphragmos fœtidus, R. et P. *Flor. Peruv.* 2. 7. *tab.* 132:—foliis obovatis vel lanceolato-ellipticis, basi in petiolum brevem decurrentibus, carnosis, eveniis, glaberrimis; corolla viridi-flava, limbo subviolaceo.—Chile, (Valparaiso et Concepcion.)

This shrub grows in the neighbourhood of the saline lake of Bucalemu, about sixty miles to the southward of Valparaiso, on the opposite side of the river Maypu, where it is called *Porotillos.* It abounds also in Concepcion, where according to Ruiz and Pavon, it is known by the name of *Guevil guevil.* It is much branched, with dense foliage: the leaves being somewhat fleshy, veinless, about $1\frac{1}{2}$—2 inches long, $\frac{1}{2}$ in. broad, tapering into a short petiole, the upper surface is smooth, channelled in the midrib, which is prominent below. The flowers appear on the termination of small branchlets, the pedicel is articulated in the middle, where a small lanceolate leaf-like deciduous bract is seen, and it becomes deflexed, giving a pendent position to the flower.

The calyx is 4 lines long, somewhat campanulate, glabrous, purplish green, with a long woolly apex to each broad short tooth. The corolla is tubular, contracted at base within the calyx, expanding above into a somewhat funnel-shaped tube, of a greenish yellow hue, about 1¼ inch long, and 3 lines in diameter, quite glabrous, the border is cleft to the mouth into 5 equal oblong lobes, the margins being broadly conduplicate and tomentous in œstivation, but glabrous when fully expanded: the base of the tube is somewhat pubescent within, thickened, and exhibiting 5 raised fleshy ribs, surmounted by a thick broad gland, which is tufted with long white hairs, from these arise the filaments, dilated at their origin, glabrous, tapering upwards into a slender form, and exserted: the anthers are of a lurid green, deeply cordate, of 2 oval lobes, fixed in the sinus on the apex of the filament. The ovarium is wholly enclosed in the persistent cup-shaped base of the corolla, which here always falls off by a horizontal line: it is supported on a small 5-lobed disc, which is shortly stipitate, and quite free. The capsule is oval, smooth, 10 lines long, 5 lines diameter, supported by the cupuliform enlarged calyx, is divided nearly to the base into 4 valves, the thickened dissepiment becoming free, to which the seeds are attached by a number of projecting fleshy seminiferous plates. The seeds are ovate, somewhat angular, with a ventral excavation, in which the hilum is seen a little above the middle. The testa is tuberculated, with intervening small transverse striæ, and encloses an oval fleshy albumen, in the centre of which the embryo is placed, which is erect and almost straight, but which viewed in front is very little sigmoid, and sideways slightly curved inwards: the radicle is thick and terete, the cotyledons being somewhat broader, slightly compressed and fleshy: I have sometimes found 3 cotyledons: they are about ¼ the length of the embryo.*

* A representation of this species with sectional details is given in Plate 21

Nicotiana.

I have very few observations beyond what has already been remarked upon the well known genus, my chief object being to describe here a new and singular species that I found in Chile in 1822. I will, however, avail myself of the opportunity of tracing an outline of its generic character, in accordance with the views before stated.

Nicotiana, Linn.—*Calyx* tubulosus, semi-5-fidus. *Corolla* hypogyna, infundibuliformis, limbo plicato 5-lobo. *Stamina* 5, inæquilonga corollæ, tubo infra medium inserta, inclusa : *antheræ* longitudinaliter dehiscentes : pollen oblongum, longitudinaliter 3-sulcatum. *Ovarium* sessile, disco annulari obsolete 4-lobo stipatum, 2-loculare, placentis linea dorsali dissepimento adnatis, multiovulatis. *Stylus* simplex. *Stigma* subpattelliforme, intus glandulis 2 magnis instructum. *Capsula* calyce persistente tecta, 2-locularis, imo septicide 2-valvis, valvis demum 2-fidis, placenta centrali denique solutis. *Semina* plurima, minima, oblonga, imo ad faciem ventralem hilo rostrato notata, testa reticulato-foveolata, costis intermediis crenulatis. *Embryo* in axi albuminis carnosi fere rectus, vel leviter incurvus, teres, radicula infera cotyledonibus subclavatis duplo longiori.—Herbæ *interdum* suffrutescentes, *sæpissime glutinoso-pilosæ in America tropica copiosæ, parcius in Asia orientali calidiori crescentes :* foliis *alternis, integerrimis* ; floribus *terminalibus, racemosis, aut paniculatis, albidis, virescentibus vel purpurascentibus.*

Nicotiana (Petunioides) *cirrhoides* (n. sp.) Petunia cirrhoides, *Nob. Trav.* 2. p. 531 ;—herbacea, erecta, glanduloso-viscida, pilisque brevibus articulatis vestita : foliis lanceolatis, basi in petiolum longum attenuatis, margine undulatis, acumine in appendicem gracilem cirrhiformem apice spathulatum attenuatis, summis linearibus longissime et tenuiter apiculatis, floralibus angustissime linearibus : floribus terminalibus paniculatis, calyce campanulato, 5-nervi, denti-

bus 3-angularibus inæqualiter et longissime apiculatis; corolla cylindracea, sordide albida, tubo 15-nervi, subglabro, basi coarctato, calyce 5-plo longiori, limbo fere rotato, obsolete 5-dentato, dentibus angustis longissime cuspidatis. —Chile ad Concon. *v. v.*

This plant which I found in Chile in 1821, bears much analogy to N. *acuminata*, Grah. and is distinguished for the very singular elongation of the midrib of the leaves, and of the nervures of the calyx and corolla. I do not remember the size of the radicular leaves, but those of the stem measure 9 inches, including 1 inch for the petiole, 5 inches for the blade, and 3 inches for its cirrhiform apical extension: they are 9 lines broad with a very undulatory margin, and are covered on both sides (like the remainder of the plant) with short glutinous articulated pubescence, the upper leaves become gradually shorter, narrower and linearly lanceolate with reflected margins, while the floral leaves or bracts are 14 lines long, quite linear and terete, being reduced to a mere slender midrib covered with glutinous pubescence. The panicle is nearly a foot in length, branching at the axil of each flower; each pedicel is about 4 lines long; the somewhat campanular tube of the calyx is 2 lines, and the mucronate teeth are from 2 to 3 lines in length; the corolla is nearly 2 inches long, and barely 3 lines diameter in the mouth, the border is narrow, with 5 short obtuse teeth, having slender cuspidate nerval extensions of 1½ line in length; one of the stamens is shorter than the other 4, which are almost in didynamous pairs, the filaments are slender and glabrous, arising from a little above the base of the tube: the ovarium is glabrous, the style slender, and the stigma has the peculiar form of this genus, the capsule is about 5 lines in length, invested by the persistent calyx, is 2-valved, and in other respects resembles that of the other species of this genus. The seeds are small, roundish, subangular, the hilum being seen on a prominent beak that projects from the lower end of the ventral face, the surface of the testa is divided into

numerous deep hexagonal areoles, separated by crenate undulating ridges, a character more or less conspicuous, and common to the seeds of all the species of this genus that I have examined; the embryo enveloped in copious albumen is cylindrical, the radical which points to the base of the seed, not far from the hilum, is slightly curved at its union with the cotyledons, which are somewhat clavate and half its length.*

I take this opportunity of indicating the suggestion, judging from specimens existing in Sir Wm. Hooker's Herbarium that the *Nicotiana quadrivalvis*, Pursh. and the *N. multivalvis*, Lindl. both from the western coast of America, may belong to the new genus established by Dr. Hooker, under the name of *Dictyocalyx*, upon a plant found by Mr. Darwin in the island of Gallapagos; but they require examination.

The 4th section of *Nicotiana* proposed by G. Don, Dict. 4. 466, in order to comprise the above species, under the title of *Polydiclia* must therefore be suppressed; the other species contained in this section (with what reason I cannot ascertain, as its seed is unknown) is certainly a plant of very opposite character, and appears to me for the reasons given in p. 101 to belong rather to *Nierembergia*. The N. *solanifolia* of Dr. Walpers, placed by him in this division (*Rep. Bot.* 4. 12) has since been referred to the section *Rusticæ*.

Petunia.

The limits of this genus, as I have before observed, are not very definite, so that some species by different able botanists have been confounded with *Nicotiana*, *Nierembergia*, and *Salpiglossis*. To *Nicotiana* a near approach is manifest, the most striking distinction being seen in the valves of its capsules, which are entire, while in the former they are cleft half way, or sometimes nearly to the base, but in *Petunia* though

* A figure of this plant with sectional details is represented in Plate 22.

the capsule is generally of more membranaceous texture, notched and entire at the apex, it is sometimes more coriaceous, when by the least pressure, the valves often split as in *Nicotiana*: there is hardly, however, so great an introflexion in the lower portion of the valves. The corolla of *Petunia* is often somewhat oblique, and marked with several branching and reticulate veins on one side, as in *Salpiglossis*, corresponding with the shorter pair of stamens.

In *Nicotiana* the inflorescence is always in terminal panicles, while in *Petunia*, the flowers are invariably axillary and solitary, on a peduncle which is generally deflexed in fruit: the ovarium as in *Nicotiana*, is always supported upon a 2-lobed, not a 4-lobed disc, which conceals the short columnar support: the lobes of the disc correspond with the sutures. The approach to *Salpiglossis** is shown in the didynamous character of its 4 longer stamens, which are inflected towards each other in 2 unequal pairs, while the fifth always shorter, though generally fertile, is sometimes sterile, and is placed between the longer pair. The style is likewise declinate at its apex, and the stigma though it bears much analogy in its structure to that of *Nicotiana*, is doubled into a somewhat bilabiate form. The difference between this genus and *Nierembergia* has been already pointed out (p. 89). The following is offered as an emended generic character.

PETUNIA: Juss. — *Calyx* tubulosus, 10-nervis, 5-partitus, laciniis spathulatis subfoliaceis. *Corolla* hypogyna, infundibuliformis, vel subhypocrateriformis, tubo cylindraceo vel ventricoso, limbo patenti inæqualiter 5-lobo, æstiva-

* I can yet hardly venture to propose the separation of *Lycium* and *Petunia* from the *Solanaceæ*, although more than half persuaded of the propriety of doing so; but if in a more advanced stage of these inquiries, more forcible reasons present themselves, I hope not to incur the charge of inconsistency for this recommendation, and for having in the preceding contributions followed the views of all former botanists in regard to the classification of these two genera in the Natural System. It will be seen, however, from what has been here demonstrated, that *Petunia* is more closely allied to *Salpiglossis* than has been generally supposed; perhaps the *Callibrachoa* of Llarve and Lexarve (which I have not yet seen) will be found to be hardly distinct from *Petunia*.

tione irregulariter obvoluto-conduplicata,* subgibbosa. *Stamina* 5, medio corollæ tubo inserta, inæquilonga, inclusa: *Antheræ* 2-lobæ, imo profunde cordatæ, lobis ovatis longitudinaliter dehiscentibus: *Pollen* oblongum, longitudinaliter 3-sulcatum. *Ovarium* subsessile, disco carnoso sub-2-lobo stipatum, 2-loculare, placentis centralibus dissepimento adnatis, multiovulatis. *Stylus* apice compressus, incrassatus, subincurvus. *Stigma* obliquum, compressum, truncato-2-lobum. *Capsula* calyce persistente testa, 2-locularis, imo septicido-2-valvis, valvis indivisis placenta centrali demum solutis. *Semina* plurima, minuta, subsphærica vel ovata, hilo ventrali, testa reticulato-foveolata, costis intermediis elevatis. *Embryo* in axi albuminis carnosi, apice subcurvatus, radicula infera tereti fere recta cotyledonibus parvis ovatis subcompressis 3-plo longiori.—Suffrutices vel herbæ Austro-Americani *subviscosi*; foliis *alternis, integerrimis, floralibus geminis*, pedunculis *extra-axillaribus, solitariis*, 1-*floris, demum deflexis*; corolla *albida vel violacea*.

1. Petunia *nyctaginiflora*, Juss. *Ann. Mus.* 2. 215. *t.* 47. *f.* 2. —*Bot. Mag. t.* 2552. *Sweet Fl. Gard.* 2. 119. *Tratt. tab.* 72. —Nicotiana axillaris, *Lam. Ill.* 2237;—herbacea diffusa, villoso-glandulosa, viscida: foliis inferioribus alternis, ovato-oblongis, obtusis, pubescentibus, basi in petiolum attenuatis; foliis floralibus sessilibus, cordato-ovatis, oppositis: pedunculis sub 3-floris, folia superantibus: tubo corollæ calycem multo excedente, limbo lato, obtuso.—Rio de la Plata.

This plant is so well known in our gardens, that it is needless to add any particular description.

* A mode of æstivation (as seen in P. *violacea*) to approach near *Salpiglossis*; its definition may perhaps be thus extended, nempe; lobis omnibus medio conduplicatis, plicaturis utrinque versus superiorem torsis, hujusce omnino interioris marginibus in flexuris contiguis utrinque obvolutis, unici lateralis aut interdum inferioris omnino exterioris marginibus imbricatis, cæterorum torsive imbricatis et vicissim obvolutis, sed duorum inferiorum dimidiis proximis gibboso-inflatis, inferne voluto-plicatis, superne autem simpliciter imbricatis: this complex mode of æstivation is shown in Plate 24.

2. Petunia *propinqua* (n. sp.);—herbacea, viscido-pilosa, caulibus plurimis prostratis, demum adscendentibus: foliis lanceolatis, acutis, basi in petiolum longum spathulatis, floralibus consimilibus, oppositis: pedunculis solitariis elongatis, calycis laciniis inæqualibus, linearibus, erectis, tubo corollæ calycem multo excedente, limbo campanulato, 5-lobo, lobis brevibus, rotundatis.—Buenos Ayres. *v. v.*

This plant is very near the former, and probably may be only a variety, but it is certainly different in appearance, and in the shape of its floral leaves: it seldom exceeds a foot in height, and is less pubescent, the stems being rounded, and slightly striate: the leaves are smaller, being (inclusive of the lengthened petiole) only 12 lines long and 3 lines broad: the pedicels are 2 inches long, the calyx, 6 lines, divided half way down into 5 unequal, linear, obtuse, erect, and not foliaceous lobes: the tube of the corolla is 2 inches long, slender, cylindrical in the lower portion, funnel-shaped above, swelling into a bell-shaped mouth, the lobes of the border being short and rounded, the whole is of a dull white colour, slightly pubescent, and marked with 5 longitudinal purplish lines: the stamens, which are included, are of unequal length, one being shorter than the rest: the capsule is little more than half the size of that of the former species.

3. Petunia *violacea*, Lindl. *Bot. Reg. tab.* 1626. *Hook. Bot. Mag. t.* 3556. Salpiglossis integrifolia, *Hook. Bot. Mag. t.* 3113. Nierembergia phœnicea, *Sweet. Fl. Gard. 2, t.* 193; —prostrata, pilis viscidis vestita, v. lanuginosa; foliis ovatis, acutis, basi in petiolum attenuatis; floribus axillaribus, pedunculatis; calycis laciniis lineari-spathulatis, obtusis, foliaceis; corollæ magnæ ventricosæ roseo-purpureæ limbo irregulari, lobis ovatis acutis.—Bonaria.

This plant, now so extensively cultivated in our gardens on account of its great beauty, scarcely requires any observation, but it may be remarked, that in the native species the leaves are much smaller than in the cultivated specimens. Several plants in Sir William Hooker's herbarium, collected near the Rio Parana by Tweedie, which appear of the same

species, have leaves not more than 8 lines long by 2 lines broad, while others from the Uruguay have leaves as large as those of our gardens, measuring about 1½ in. long, including the petiole, and 4½ lines broad.

4. Petunia *intermedia*, Don. Nierembergia intermedia, *Grah. Ed. Ph. Journ.* 14, 175, *Sweet Fl. Gard.* 3, *t.* 237. Salpiglossis linearis, *Hook. Bot. Mag. t.* 3256;—herbacea, prostrata, pilis glanduloso-viscidis undique tecta; foliis linearibus, obtusis, dense pubescentibus; corollæ tubo vix calyce longiori, luteo, striato, fauce ventricoso, limbi laciniis emarginatis, puniceis; stylo clavato; capsula costata.—Bonaria.—*v. s. in herb. Hooker.*

The leaves are from 4 to 8 lines in length, 1 line broad, and somewhat spathulate at base.

5. Petunia *elegans* (n. sp.);—suffruticosa, pilis articulatis viscidis undique dense tecta: caulibus adscendentibus, delapsu foliolum basi cicatrisatis, ramosis, superne foliosis; foliis confertis, linearibus, obtusis, margine revolutis, subtus canescentibus, in petiolum brevissimum cito angustatis, demum deflexis; floribus axillaribus pedunculatis, corollæ roseæ tubo ventricoso calycem 3-plo excedente.—Minas Geraes, Brasiliæ.—*v. s. in herb. meo et Hook.*

var. β. ramis erectis, elatioribus, virgatis, foliis erectis, adpressis.—Minas Geraes, (*Claussen*) *in herb. Hook.*

This is a very distinct species, the stem and branches being decidedly woody and of hard texture; the leaves are from 6 to 10 lines long, 1-1½ line broad, densely covered with short viscid pubescence, which is incanescently tomentous beneath. The peduncles are 6 lines long, and become deflexed on the fall of the corolla: the calyx is 3-4 lines long, cleft into 5 unequal linear obtuse teeth; the corolla is about 9 lines long, 6 lines broad across the mouth, the tube being contracted below, where it is yellowish, above it is funnel-shaped and ventricose, of a deep rose colour, and veined, the border being divided into 5 ovate rounded lobes; the stamens are unequal, 4 of the anthers approximate in didynamous pairs, while the fifth is intermediate between the longer pair, and is much shorter: the ovarium is obovate

smooth, the supporting column being enveloped by a fleshy annular 2-lobed disc, which invests the base of the ovarium: the style is compressed, 2-grooved, and declinate at summit; the stigma is flattened, truncated, somewhat tubular, with an erect edge, containing within its cavity 2 globular, papillose, viscid glands. The capsule is small, obovate, smooth, and enclosed within the persistent calyx, 2-celled, 2-valved, each valve being entire, notched at the apex, with sutural, scarcely introflexed margins. The seeds are oblong, rounded, with the hilum on its ventral face, dark brown, reticulately areolar; the embryo, enclosed in fleshy albumen, is terete, and slightly curved at the junction of the cotyledons with the radicle, the latter being twice the length of the former, which are slightly compressed, somewhat broader, and ovate.*

6. Petunia *parviflora*, Juss. *Ann. Mus.* 2, 216, *t.* 47, *f.* 1. Nicotiana parviflora, *Lehm. Gen. Nicot. Mon.* 20. Lindernia Montevidensis, *Spr. Syst.* 2, 769;—herbacea, prostrata, villoso-glandulosa, viscida, radice humifusa, caulibus plurimis ramosis; foliis subfasciculatis, lineari-oblongis, obtusis, crassiusculis; pedunculo brevissimo; calycis laciniis inæqualibus, spathulatis; corollæ tubo calycem fere duplo excedente, fauce intus prominente, limbi segmentis obtusis.—Bonaria. *v. v.*

I found this plant growing in moist places in the neighbourhood of Buenos Ayres; its root is suffruticose, spreading into many branching prostrate stems, which are of purplish hue, rugous and spreading at the axils; the leaves are often fasciculate, linear, obtuse, spathulate, rather fleshy and veinless, covered with many rugous tubercles, and beset with short, close, downy, viscid hairs; they are 4 to 6 lines long, and 1 line broad; a fleshy, raised gland is seen on each side of the petiole in the usual place of stipules; the peduncle is short, axillary, 1 line long; the calyx is 3 lines in length, and cleft nearly to the base into 5 unequal, spathulate, obtuse, erect segments, which are fleshy and covered with glandular hairs;

* A representation of this species is given in Plate 24.

the tube of the corolla is nearly cylindrical, 5 lines long, yellow, and marked outside with 5 purplish lines, the border is cleft into 5 rather equal roundish segments, each with a purplish central line and a mucronulate apex, it is of a lilac colour, and somewhat oblique, the upper lobe being more erect, and the lower ones somewhat more reflected, the throat, of a deep lilac hue, is compressed and hollowed inward on the front side, in a somewhat personate form; the stamens are unequal, the 5 filaments arising from the contraction above the base of the tube, are white and compressed, the short sterile stamen is seen below the ringent compression of the tube, between the front and longer pair, while the upper pair is somewhat shorter, the fertile anthers, which approach each other by the inflection of the filaments, are 2-celled, ovate, the 5th sterile one being smaller, erect and castrate. The ovarium is oblong and smooth, 2-celled, laterally grooved on each side, and seated on a somewhat 2-lobed, annular, fleshy disc, the lobes corresponding with the grooves and the edges of the dissepiment; the style is slender, greenish, 2-grooved and compressed at the summit, where it is deflected towards the upper pair of anthers in the mouth of the tube, the stigma is somewhat clavate, or rather 2-labiate, with a thin expanded margin, enclosing 2 large papillose viscid glands. The capsule is small, obovate, smooth, enclosed within the persistent calyx, 2-celled, 2-valved, with a notch in the apex of each valve, where it splits half way down by pressure. The seeds are attached by a point on their ventral face to the thickened portion of the dissepiment that becomes free and is parallel with the valves: they are numerous, light brown, and oval, the surface being divided into rather large, deep areoles, separated by straight prominent ridges. The embryo is cylindrical, slightly curved, the radicle is somewhat thick in proportion to its length, the cotyledons, scarcely broader than the radicle and half its length, are somewhat compressed and ovate.*

* A figure of this species, with sectional details, is represented in Plate 23 of this work.

7. Petunia *ovalifolia* (n. sp.) ;—suffruticosa, subglabra ; foliis obovatis, erectis, utrinque scabrido-punctatis, margine scabrido-ciliatis, sessilibus, rachi prominenti basi valde tumido, supra venis impressis, subtus evanidis ; pauciflora, pedunculo axillari folio dimidio longiore, corollæ tubo calycem 5-partitum vix excedente, limbo expanso dense purpureo, interdum pallidiori, lobis ovalibus emarginatis.—Rio de la Plata et Brasilia meridionali.—*v. s. in herb. Hooker.* Banda oriental ad Coloniam, (*Tweedie, n.* 286). Viamonte, Prov. Rio Grande, (*rupibus siccis, Tweedie, n.* 287). Rio Grande, (*Isabelle*).

This is a plant differing in its aspect from all other species, it has a woody repent root, with erect branches about 6 inches in height, the internodes being shorter than the leaves, which are sessile, erect, cuneately ovate, 7 lines long, and nearly 4 lines broad, the midrib is prominent below, terminating on the stem in a tumid pulvinate swelling, they are covered on both sides with short, rigid, spreading pubescence, the margins ciliate ; the pubescence of the peduncle and calyx is similar, but often terminating in a viscid gland ; the peduncle is 9 lines long, the calyx 5 lines, cleft half-way into 5 angular, somewhat oblong and obtuse segments ; the tube of the corolla is 6 lines long, swelling towards the mouth, with a broad spreading border nearly $\frac{3}{4}$ of an inch in diameter, divided into 5 oblong emarginate lobes of a deepish purple colour : the capsule is smooth, obovate, shorter than the persistent calyx that encloses it, the valves being entire, with a notch in the apex of each.*

8. Petunia *viscidula*.—Nierembergia viscidula, *HBK.* 7, 205 ; —herbacea, procumbens, tenuissime viscidulo-hirtella, foliis subsessilibus, lanceolatis, vel oblongo-spathulatis ; floribus solitariis, axillaribus, breviter pedunculatis, corollæ tubo calycis laciniis foliaceis spathulatis subæquante.—Mexico, *in hort. cult.*

Nothing seems to be known of this plant beyond the

* A figure of this plant is given in Plate 24.

description of Prof. Kunth, above referred to, from which it evidently appears to belong to this genus, rather than to *Nierembergia*. The branches are prostrate, about one foot long; the leaves are somewhat thick and membranaceous, six to seven lines long, and one and a half to two and a half broad; the peduncles are one line long, viscidly pubescent; the calyx has a short tube, with obtuse, lanceolately spathulate, unequal, spreading segments; the corolla, of a bluish colour, has a funnel-shaped tube as long as the calyx, pubescent, its limb with five roundish lobes; the stamens are unequal, included; the ovarium is supported by a small annular disc; the style is filiform, slightly bent, as long as the stamens; the stigma two-lobed and papillose; the capsule, enveloped by the persistent calyx, is two lines long, with two entire submembranaceous valves; the seeds are minute, angular, reticulate, with a two-lobed embryo enclosed in copious albumen.*

Stendel states that *Nierembergia graveolens* of St. Hilaire, which is the *N. pubescens* of Sprengel, is identical with this species; but their descriptions do not accord.

* Since the above was in type, it has been kindly suggested to me by Mr. Bentham, that this species is probably identical with the *Callibrachoa procumbens*, Ll. and Lex, the *Salpiglossis prostrata*, Hook. Arn. I am glad to find what I hinted in regard to this plant (see note p. 107), thus soon confirmed by so learned an authority; all the information I could glean on the subject, was derived from the short generic character, published in Walp. Rep. vol. iii. p. 958, its specific details being omitted in the enumeration in p. 178 of that work. On stating my impression to Sir Wm. Hooker, he kindly took much trouble to search for his Californian specimens, but in vain, as, unfortunately, they had been misplaced in his Herbarium.

[It is nearly two years since the above note appeared in print, and it is now only (Feb. 1848,) that I have been able to see, for the first time, a specimen of the genus *Callibrachoa*, from Loredo, Mexico, upon the borders of Texas; this has served to confirm the anticipation before expressed, as, upon examination, I find this, the only described species of the genus, is in no way distinct from *Petunia parviflora*, which is fully described in a previous page (p. 111). To this last-mentioned species, must now, therefore, be added, as synonyms, *Salpiglossis prostrata*, Hook. and Arn., and *Callibrachoa procumbens*, Llav. et Lex. DC. Prod. vol. ix. 462.

I avail myself of this opportunity of observing, that I have since had an opportunity of examining living specimens of *Petunia* and *Nierembergia*, and feel convinced that these genera are so very intimately allied to *Salpiglossis*, that they must all be referred to the same Natural Order, for, independently of their somewhat bilabiate corolla, with unequal and almost didynamous stamens, of which full details are exhibited in plates

SCLEROPHYLAX.

The plant upon which this genus is proposed to be established, was found by me during my rapid journeys across the Pampas, from Mendoza to Buenos Ayres, in 1825 and 1826, but I could not examine its details until 1827, when I was first able to observe the results of the present analysis. It is of a prostrate, succulent habit, resembling much that of a *Tetragonia*, more especially as the drupaceous covering of the seed becomes ligneous and spinescent, owing to the enlargement and tumescence of the calyx, which finally encloses the capsule. My attention having again lately been directed to this anomalous plant by Sir William Hooker, at the suggestion of Prof. Arnott, who had noticed it in the collection of Doctor Gillies, I was induced to examine the specimens existing in the Herbarium of the former distinguished botanist, which I found to constitute two other species, distinct from that of my own collection. These plants are certainly very curious in their structure, and cannot be referred to any known natural order. Their leaves are geminate, as in the *Nolanaceæ*, and they resemble in their fleshy and prostrate habit, many of the plants of that family, with which also the structure of their flowers corresponds, although these are very small and inconspicuous, approaching in size and form to those of *Petunia parviflora*, which

18, 23, and 24, the peculiar imbricate mode of æstivation of the flower, will be seen to be similar to that of *Salpiglossis*, and therefore quite different from the induplicato-valvate manner of præfloration, existing universally throughout all the *Solanaceæ*, if we except *Hyoscyamus* and *Lycium*. This latter genus, it appears to me, should also be referred to *Scrophulariaceæ*, rather than to *Solanaceæ*. In *Capraria*, especially the *Xuaresia biflora* of the Flora Peruviana, we have an instance of a regular gamopetalous corolla, with five equal stamens, as in *Lycium*. So much, indeed, does that plant resemble this last mentioned genus, that Sir William Hooker (Bot. Misc. vol. ii. p. 231) referred it doubtfully to *Witheringia*, remarking that its twiggy, glabrous stem, and long, narrow, lanceolate leaves, gave it much the appearance of a *Lycium*. The baccate fruit of this genus cannot be held as a reason for its exclusion, as several similar instances occur among the *Scrophulariaceæ*; viz.—*Duboisia*, *Halleria*, *Leucocarpus*, and *Teedia*. *Hemiphragma*, a genus closely allied to *Capraria*, has also a baccate fruit, although subsequently dehiscent, and many other similar cases of this kind occur among the *Scrophulariaceæ*. We have also in *Verbascum*, a nearly regular five-lobed corolla, with imbricate æstivation, and with five stamens, generally all fertile, and for the most part equal, as in *Lycium*.]

I have described on a former occasion, p. 111. plate 24; for the tubular corolla is, in like manner, ventricose on one side, with a somewhat five-lobed, companulate and slightly bilabiate border, and it offers quite the induplicato-valvate æstivation of the *Cestraceæ* and *Solanaceæ*. The calyx has a very short, fleshy tube with five unequal, erect segments, two of them being reduced to the size of small teeth, while the other three are more or less half the length of the corolla; in two species these are foliaceous and singularly veined, in the other they are subulate and fleshy; the tube of the calyx enlarges and becomes intumescent and bony, as the fruit advances to maturity; and in the last-mentioned instance the calycine lobes in like manner are at length converted into spines. The structure of the seed, however, is quite at variance with that of the *Nolanaceæ*, approaching nearer that of the *Myoporaceæ* or *Ehretiaceæ*, for the drupaceous calyx encloses an indehiscent, two-celled carcerule, with a single seed suspended from the summit of each cell, the almost straight and inverted embryo being nearly the length of its fleshy albumen, and having a small superior radicle with two oblong, compressed cotyledons. I have called the genus SCLEROPHYLAX, from σκληρος, *durus* and φυλαξ, *carcer*, because of the manner in which the seed-vessel becomes incarcerated by the singular enlargemont and bony intumescence of the calyx. The following generic character will explain its structure.

SCLEROPHYLAX. (gen. nov.).—*Calyx* 5-partitus, tubo 5-gono brevissimo, laciniis 2 vel 3, elongatis, triquetris, subulatis, aut interdum expansis, foliaceis, subcarnosis, alteris brevibus, fructifer auctus. *Corolla* hypogyna, gamopetala, tubo infundibuliformi, sub faucem contractam superne ventricoso, limbo brevi, 5-plicato, subcampanulato, sub-bilabiato, labio superiore 3-lobato, inferiore 2-lobato, lobis omnibus æqualibus, brevibus, obtusis, æstivatione induplicato-valvatis. *Stamina* 5, tubo corollæ inserta, inclusa: *filamenta* inæqualia, gracilia, paulo dilatata, uno breviore, alteris subæqualibus, apice incurvato-declinatis: *antheræ* 2-loculares, ovatæ, basi cordatæ, in sinu affixæ, connectivo nullo, rima longitudinali extus dehiscentes. *Pollen* ovatum, longitudinaliter 3-sulcatum. *Ovarium* superum ovatum, conicum, 2-loculare: *ovula* in loculis solitaria, apici appensa, anatropa. *Stylus* fili-

formis, longitudine staminum, apice inflexus. *Stigma* sublaterale subliguliformi-capitatum. *Fructus* e calyce incrassato et demum indurato nucumentaceus, lignosus, turbinatus, 5-gonus, vertice depresso, et stylo perforato, angulis inæqualiter elongatis, spinisque 2–3 longis interdum terminatis. *Carcerula* omnino inclusa, libera, chartacea, indehiscens, 2-locularis, loculis monospermis (uno antico, altero postico). *Semen* inversum, obovatum, ex apice pendulum : *testa* tenuis, chalaza apicali rapheque longitudinali sublaterali notata : *embryo* in axi *albuminis* carnosi paulo incurvatus, *cotyledonibus* oblongis, compressis, crassiusculis, *radicula* brevi tereti supera, 2-plo latioribus, et 3-plo longioribus. Herbæ *prostratæ*, Americæ intertropicæ *indigenæ ;* caulibus *plurimis, angulatis, flexuosis, divaricatim ramosis :* foliis *geminatis, spathulato-oblongis, cum petiolo continuis* ; floribus *axillaribus binis,* [1 *præcociore*], *insertione petiolorum fere sessilibus, ebracteatis ;* fructibus *deflexis, plerumque ad axillas deformatim concretis, nodos tumescentes et spinescentes formantibus.*

1. Sclerophylax *spinescens :* prostrata, caulibus humifusis, diffusis, nodis spinescentibus : foliis geminatis spathulato-oblongis, subcarnosulis, glaberrimis, eveniis, margine tenui integris ; floribus folio florifero brevioribus, omnino glabris, calycis lobis triquetro-subulatis, carnosulis, angulis membranaceis demum spinescentibus.—Arroyuelo de San Josè, Prov. Cordovæ, in uliginosis salitrosis. *v. v.*

This species was found by me in the locality above quoted, growing abundantly on the margin of saline swamps, and is probably diffused over the Pampas in similar situations, as I find in Sir William Hooker's Herbarium, specimens collected by Tweedie, from the neighbourhood of Buenos Ayres. The branches, dichotomously ramifying at each axil, spread out to the length of about eighteen inches ; the stems are angular and herbaceous ; the leaves, including the petioles, are about the length of the internodes, one and a quarter, to one and a half, sometimes two inches ; they are oblong, scarcely acute at the apex, tapering towards the base into a petiole of the length of the blade, which is three lines broad ;

they are somewhat fleshy, the main rachis, as well as a very few nerves, are remarkably tortuous, and are quite veinless, or, at least, the veins are so deeply immersed as not to be visible. The leaves of the younger axils, at the period of flowering, are scarcely longer than six lines, and the flowers do not exceed three lines in length. The fruit, which is rarely free, is quite turbinate, with a thin fleshy pericarp, investing a hard bony nut of similar form, four lines long, depressed and disciform at the summit, the angles being terminated by sharp spines, of which three are erect, and nearly as long as the body of the fruit: this encloses a small oval carcerule, or indehiscent, two-celled, chartaceous capsule; the single suspended seed which fills each cell, is two lines long, and is very slightly incurved, tapering to the summit. The most remarkable anomaly attached to this plant, is the spiny intumescence of the axils: this is nearly a constant character, and is only wanting in the few instances where the short peduncle of the flowers and fruit remain perfect and free; in most cases, owing probably to the operation of insects, the two nuts formed at each node, become deformed and absorbed into the axil, which, in consequence, swells, and forms a many-spined, salient, knotty, and prickly joint. On opening these, I have always found the grub of an insect, which has generally destroyed one of the seeds. This character is not singular, for Chamisso and Schlechtendahl describe a plant from Mexico (*Gongylocarpus rubricaulis*, Linn. 5.558), belonging to the *Onagraceæ*, where the drupaceous fruit in like manner, and probably from a similar cause, becomes concrete with each axil, which hence assumes a swollen and deformed appearance.*

2. Sclerophylax *Arnottii*: nana, prostrata, ramulis paucis brevibus: foliis spathulatis, sub-3-lobatis, lobis lateralibus rotundatis, subdeltoideis, apice obtusiusculis, mucronulatis, fere eveniis, margine membranaceis, basi in petiolum longum linearem attenuatis: floribus parvis, calycis lobis inæqualiter foliaceis, in fructu persistentibus, nervis 3 parallelis retrorsum anastomosantibus

* A figure of this plant, with full generic details, is shown in Plate 25.

notatis, corollæque tubo brevi, ventricoso, imocoarctato, scabrido-pilosis.—San Juan, Prov. Argentin-—*v. s. in Herb Hook.* (*Gillies.*)

This is very similar in habit to the former species, but from the solitary specimen I have seen, it appears altogether more diminutive, the branches extending only three or four inches in length: the leaves, however, are larger in proportion; the blade is broadest at the base, contracted in the middle, and terminates in a narrow, obtuse, and mucronulate apex; at base, it tapers gradually into a narrow linear petiole of equal length, being altogether one inch long, and three and a half lines broad: they are thick and fleshy, and without any apparent venation: the flowers are five or six lines long; the corolla is broader in proportion, and, as well as the calyx, is covered with short rigid jointed pubescence: the calycine segments are broad, foliaceous, oblong, pointed, three of them being half as long as the corolla; they are very distinctly veined, with three almost parallel nervures, connected together by several retrorsely branching veins: the tube thickens, as in the preceding species, into a hardened nut-like body, which, in like manner, becomes conglomerated with the axillary node; it is crowned with its persistent foliaceous lobes, which, however, do not become spinescent, as in the former species. The structure of the flower, the stigma, and the seed, exactly resemble that of *S. spinescens*, except that the stamens are in some degree shorter, the anthers scarcely rising above the middle of the tube of the corolla.*

3. Sclerophylax *Gilliesii*: planta rigidior, prostrata, caulibus crassioribus, angulatis, flexuosis, nodis valde tumidis: foliis geminatis, spathulato-rhomboideis, nervosis, utrinque glaberrimis, nitidis, nervis venisque prominentibus, in petiolum brevem latum attenuatis: floribus folio florifero longioribus, calyce 5-gono, tubo brevissimo, lobis inæqualibus, foliaceis, lineari-lanceolatis, fructifero valde aucto: corollæ tubo paulo ventricoso, glabro, genitali-

* This species is figured in Plate 26 A.

bus duplo longiore, limbo 5-lobo expansiore sub-bilabiato.—Rio Diamante, Prov. Mendozæ Argentin.—*v. s. in Herb. Hooker* (*Gillies*).

This plant is very distinct in its habit from the two former species, the stem being much thicker, far more flexuose and angular, with more distant internodes, the petiole and part of the blade of the leaves, together with the ripening fruit, being often confluent with the axils, which are much more swollen, the petioles in such cases becoming confluent with, and their margins decurrent on, the angles of the stems; the petiole is shorter and broader than in either of the former species. The leaves, including the petiole, are nine lines long, and three lines broad; and unlike the two former species, they are marked with distinct nerves and veins, which are especially prominent below. The tube of the calyx is short, but its border is divided into five large, broad, foliaceous leaflets, which are somewhat unequal in length, two of them being one-third of the length of the flower. The corolla is far more slender and infundibuliform than in the two preceding species, and is altogether seven lines long, the tube being quite glabrous, and rather ventricose above; its border somewhat bilabiate, is divided into five equal, short, obtuse lobes. The stamens are unequal in length, the two longer ones scarcely reaching the middle of the tube of the corolla, and the fifth shortest is not declinate at the apex as the four others. The fruit, in every instance I have seen, becomes enclosed in the tumescent axil; the tube of the calyx enlarges, and becomes converted into a hardened ligneous covering, which is crowned by its persistent foliaceous lobes: the seed in its structure differs in no way from that of the two preceding species.*

The plants just described, cannot be referred satisfactorily to any known natural order. They resemble *Nolanaceæ*, *Ehretiaceæ*, *Convolvulaceæ*, and *Solanaceæ*, in their tubular corolla, with five included stamens, and more especially the latter in the indupli-

* A drawing of this species is shown in Plate 26 B.

cated æstivation of its border, but they differ from all these families, by having a two-celled ovarium, with a solitary ovule suspended from the summit of each cell, and in having a nearly straight embryo, with superior radicle. The approach to *Nolanaceæ* is more evident, by their being in like manner prostrate or straggling succulent plants, growing in saline moist places, by their geminate, spathulate, fleshy leaves, with expanded petioles, one of which is always inserted laterally a little higher than the other upon the stem, to the salient angle of which one of their edges is generally decursively continuous; they have also a solitary flower at the origin of each petiole. They differ, however, from that order, in having a single two-celled pistillum, not distinct ovaria, for *Nolana*, and most of its congeners, have always several distinct gynobasic carpels, generally one-celled, but some of these are often united without regularity into two or many-celled nuts, which, in such cases, never present more than a single ovule in each cell. *Grabowskya*, which I have referred with some hesitation to *Nolanaceæ*, but which probably represents the type of a distinct suborder, exhibits a similar tendency to form spines at the axils, and presents also a single pistillum, terminated by a lengthened style, and two two-celled nuts, each with a solitary ovule, but here, as in the true *Nolaneæ*, the embryo is nearly annular, with the radicle pointing to the basal hilum. The group of plants in question appears to differ from *Nolanaceæ*, exactly as the *Myoporaceæ* are held distinct from *Verbenaceæ*; viz., by having a somewhat bilabiate corolla, and a superior, instead of an inferior, radicle. From the *Scrophulariaceæ* they are distinguished by a very different æstivation of their corolla, and more particularly by a totally different structure of the ovarium and seed, in which latter respect they also differ from the *Solanaceæ*, notwithstanding that they much resemble this order in the shape and æstivation of the corolla. They certainly approach, in many respects, to the *Myoporaceæ*, (especially through *Disoon* and *Nesogenes* with their bi-locular, 1-ovulate ovaria), with which Order they agree, in their somewhat bilabiate corolla, and in having suspended ovules and albuminous seeds with a straight

embryo and superior radicle; but they differ in the æstivation of the corolla, in possessing five, instead of four stamens, in their anthers being two-celled, with longitudinal dehiscence, in their leaves being geminate, not opposite, and in their fleshy herbaceous habit, not having ligneous erect stems.

To the *Stilbaceæ* they also appear to offer some approach, on account of their tubular calyx with unequal teeth, their funnel-shaped corolla with a bilabiate border, having an induplicate æstivation, and a superior two-celled ovarium, with a single ovule in each cell: but this is erect, not suspended. They have also a slender capsule enclosed in the persistent calyx, and although it is two-celled, and monospermous in each cell, the seed is erect, and the embryo has an inferior, not a superior, radicle. They differ in many other respects, and are altogether extremely different in habit.

There are many analogous points of structure common to *Trapa* and *Sclerophylax* that should not be lost sight of. In the former, the calyx, though only half inferior, enlarges in like manner in fructification, entirely grows over the ovarium, and finally becomes enlarged and lignescent, the lobes being also converted into spines. The corolla, although consisting of distinct petals, offers a plicato-valvate æstivation. The ovarium is two-celled, with a single ovule suspended in each cell. Here, however, the analogy ceases, for in *Trapa*, by the abortion of one of the ovules, the fruit becomes one-celled, with a single exalbuminous seed, and although the radicle is superior, the embryo, from the diminutive suppression of one of its lobes, becomes pseudo-monocotyledonous, added to which, the habit of the plant is quite distinct, and its alliance very remote.

To *Tetragonia*, as I have before observed, there is certainly much apparent resemblance, but it is altogether external, for notwithstanding the similarity of its habit, and the spiny intumescence of its fruit, there exists no analogy whatever in the structure of the flower, or of its seed, to that of *Sclerophylax*.

On a former occasion (see page 67,) I have endeavoured to trace the relationship of the *Borragineæ* to the *Convolvulaceæ*, through the intermedium of *Nolanaceæ* and the *Dichondreæ*,

on account of the gynobasic insertion of the carpels, but the transition is now more distinctly visible and gradual, through the medium of the *Ehretiaceæ*, this *new group*, and the *Nolanaceæ*.

This affinity of *Sclerophylax* (having suspended ovules) with the *Nolanaceæ* and *Borragineæ*, (having gynobasic carpels and erect ovules,) it must be confessed, does not, at first sight, appear so evident as will be seen on further enquiry. In this consideration, one feature should be constantly borne in mind, I mean that of the relative position and mode of attachment of the ovules: in most cases analogous to the present one, (*i. e.* where the radicle of the embryo points towards the hilum,) these may vary either in having a superior point of suspension, an axile attachment, or a basic origin,—differences that really amount to little else than the relative height of the point of adhesion of the carpels, or that terminal summit of the gynobase, where its nourishing vessels, proceeding from the torus, penetrate the walls of the ovaria, and which can always be distinguished from the fertilizing vessels proceeding from the style. These several conditions have been ably explained by M. Aug. de St. Hilaire, in his admirable paper on the gynobase (Mem. Mus. 10, p. 131.) Following up this view of the case, there will not be found so great an amount of discrepancy in the structure of the seed of *Sclerophylax*, and that of the various genera included in the orders above mentioned; for, in examining the dissepiment of the seed of this genus, the gynobasic vessels (as might be expected) are seen as a distinct rachis along its central axis, terminating in the point of suspension of the ovules, and presenting an instance somewhat analogous to that which St. Hilaire calls an elevated gynobase. In *Nolanaceæ* and *Borraginaceæ*, where generally there exists, on the contrary, a very depressed gynobase, it is the style that is seen in an analogous position, as a rachis in the central axis of the carpels, in consequence of the ovaries having an entirely basic attachment: in these two extreme cases, the embryo is alike seen in the axis of the albuminous seed, with the radicle directed to the point of its attachment. Even in the Order *Bor-*

raginaceæ, where, in most instances, the gynobasic point of union of the carpels is generally on the level with the gynophorus itself, several instances occur, (in *Asperugo*, for instance,) where the apical point of the gynobase is mid-way, or near the summit of the axile line of juncture of the carpels, at which point they are in fact pendulous. In other cases again, this point is at the very summit of the carpels, as in *Mattia*, *Pectocarya*, and others of the tribe *Cynoglosseæ*, where the ovaries, at first pendulous, at length, after development, exhibit their carpels in an absolutely centrifugal position upon the summit of the gynobasic point of their attachment.

It is evident, from the foregoing facts, that *Sclerophylax* cannot be referred to any known Natural Order, and it is, therefore, essential to find some place for it in the system. Some objections may be made to the establishment of a distinct order upon a solitary genus; but we have at present no less than twelve natural families among phanerogamous plants, each based upon a single genus. Even *Nolana* was in a similar position, with only seven species, when the family of the *Nolanaceæ* was first proposed in 1833: the subsequent collections of Cuming and Bridges have increased the number of genera to six, and the amount of species to thirty. Under these circumstances, I have less hesitation in offering the genus under consideration, as the type of a distinct family, under the name of *Sclerophylaceæ*; and accordingly, I proceed to suggest the position it will probably occupy in the natural system, an inference derived from the comparison of its leading characters with those of the various families to which it can claim the smallest relation.

In the following tabular view, the various orders there enumerated, which form a very natural circle, bound together by many common ties, are placed in juxtaposition according to the number of the stamens, the æstivation of the corolla, the number and direction of the ovules, and the relative position of the embryo. This selection of characters may not be the most appropriate with a view to methodical arrangement, and is not offered with any such intention; but it answers our present purpose of determining, by such

artificial means, the most fitting position in the system for *Sclerophylax*, which on account of its apparently anomalous structure, does not at first sight fall into any distinct place, and can hardly be attached as a suborder to any of the families here enumerated. This table, founded upon such artificial characters, appears to indicate by a gradual transition, a chain, nearly as perfect as any linear distribution, based upon more methodical principles, can be expected to exhibit, and certainly it does not materially differ from the most approved arrangement after the method of Jussieu.

Flowers with a gamopetalous hypogynous corolla, and one or more superior ovaries with 1, 2, or 4 cells in each, never 3 or 5; placentæ never parietal; when the cells are 2, one is always posterior, the other anterior with respect to the axis of inflorescence. They consist of the class *Nuculiferæ*, and part of *Tubifloræ*, Endl.

Orders.	Stamens.	Æstivation of corolla.	Ovules.		Radicle in regard to hilum—to base of fruit.	
Labiatæ	4	imbricate	1 in each cell	erect	inferior	inferior
Borraginaceæ	5	border below plicate, above, cortortu-imbricate	1 in each cell	suspended	superior	superior
Cordiaceæ	5	border, below plicate, lobes conduplicate and plicato-valvate	1 in each cell	suspended	superior	superior
Heliotropiaceæ	5	border, below plicate, lobes conduplicate and plicato-valvate	1 in each cell	suspended	superior	superior
Ehretiaceæ	5	lobes, induplicato-valvate	1 in each cell	suspended	superior	superior
Sclerophylaceæ	5	lobes, induplicato-valvate	1 in each cell	suspended	superior	superior
Grabowskyeæ	5	tube subplicate—lobes often conduplicate—margins always contortu-imbricate	1 in each cell	suspended	superior	superior
Nolaneæ	5	tube subplicate—lobes often conduplicate—margins always contortu-imbricate	1 in each cell	suspended	superior	superior
Dichondreæ	5	tube subplicate—lobes often conduplicate—margins always contortu-imbricate	1 in each cell	suspended	superior	superior
Convolvulaceæ	5	lobes conduplicate—conduplicato-valvate and twisted, or reduplicato-valvate and straight	1 or 2 in each cell	erect	inferior	inferior
Erycibeæ	5	lobes conduplicate—conduplicato-valvate and twisted, or reduplicato-valvate and straight	4 in a single cell	erect	inferior	inferior
Cuscutaceæ	5	almost valvate	2 in each cell	erect	inferior	inferior
Stilbaceæ	5		1 in each cell	erect	inferior	inferior
Cestraceæ	5	induplicato-valvate or plicato-valvate	several in each cell	horisontal	inferior	centripetal
Solanaceæ	5	induplicato-valvate or plicato-valvate	several in each cell	horisontal	inferior	centripetal
Nicotianeæ	5	plicato-imbricate	several in each cell	horisontal	inferior	centripetal
Salpiglossideæ	5	plicato-imbricate	several in each cell	horisontal	inferior	centripetal
Scrophulariaceæ	5		several in each cell	horisontal	inferior	centripetal
Selaginaceæ	5	imbricate	1 in each cell	suspended	inferior	inferior
Verbenaceæ	4	imbricate	1 in each cell	suspended	inferior	inferior
Avicenniæ	4		1, 2, or 4 in each cell	suspended	superior	superior
Myoporaceæ	4		1, 2, or 4 in each cell	suspended	superior	superior

CYPHOCARPUS.

The discovery of a plant possessed of many abnormal characters, is always more interesting to the Botanist, than the detection of a new genus, marked by features that only serve to fill up an ordinary link in the chain of some well-recognized family. The plant under consideration will be seen to be extremely anomalous and curious in its structure. It was collected in Chile by Bridges, and exists in the Herbarium of Sir William Hooker, who, with his accustomed liberality, had the kindness to offer it to me for examination. It evidently belongs to the class *Epicorollia*, or rather the *Campanuleæ* of Jussieu, according with the *Campanulaceæ*, *Lobeliaceæ*, *Goodenoviaceæ*, *Cyphiaceæ*, and *Stylidiaceæ*, in having an epigynous corolla and stamens alternate with its lobes: the insertion of the stamens, however, is not epigynous, as in all these families, but decidedly perigynous, originating in the middle of the tube of the corolla. It corresponds also with the four last-mentioned orders, in the corolla having an irregular border, but it is not divided into distinct petals: its tube is not cleft on one side to the base; nor are the stamens in any degree syngenesious, as always occurs, at least, in the *Lobeliaceæ*. From the *Goodenoviaceæ*, it differs in the æstivation of the corolla; for, in that order, the broadly-winged margins of each lobe respectively are involutely imbricated upon one another,* while in *Cyphocarpus* the margins are irrespectively induplicate with those of the contiguous lobes and valvate with them: these lobes, too, are of one equally thin membranaceous texture, not thickened in the middle as if another narrower petal were glued upon the back; it must

* This is a distinction deserving of some notice. Endlicher, in his character of the *Goodenoviaceæ*, (Gen. Pl. p. 506) defines this by saying "lobis æstivatione præinduplicatis," which conveys a very incorrect notion of this peculiar manner of præfloration, especially if we confine that expression to the limit given to it by Prof. Lindley in his Intr. Bot. 411, fig. 6. Mr. Robert Brown, who founded the order, expresses this feature in far more exact terms, viz., "lateribus æstivatione induplicatis" (Prod. 573); but it appears to me, it would be still more correctly defined by the following amplification: "marginibus æstivatione inter se involuto-plicatis, plicaturis valvatim clausis."

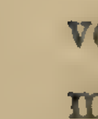
not be forgotten, however, that the hooded portion of the upper lip of *Cyphocarpus*, more or less partakes of this character. In regard to æstivation, the approach to the *Lobeliaceæ* and the *Campanulaceæ*, is equally evident, in which latter family, although replicately valvate in *Specularia*  , it is more generally plicately valvate, as in *Campanula* , a form sometimes scarcely distinguishable from the induplicato-valvate mode of æstivation seen in *Cyphocarpus*. In the structure of its ovarium, it resembles at the period of its first growth, that usually seen in most of the genera of the *Campanal* alliance: it is two-celled, with numerous ascending ovules arranged about the axis, on each side of a narrow central placentary line; but the dissepiment consists of an extremely delicate membrane, which at an early stage begins to shrink from the walls of the ovarium, and soon evanesces entirely, leaving a unilocular cell, with a linear, central, free placenta, about which the ovules are crowded, and become perfected. This placenta is very narrow, and although thicker than the dissepiment, is still membranaceous, being marked by six very fine parallel ovuligerous nerves, arranged in threes, and leaving a broader intermediate space, which is sometimes, but not always, cleft for a short distance in the middle: this shows an evident tendency towards the placentation of the *Lysipomeæ*, especially through the genus *Hypsela*, of Presl. I am not aware of the existence of a similar structure in any genus of this alliance. It differs also from all the orders before mentioned, in the peculiar form of its corolla, which is quite monopetalous and bilabiate, one of the lips of its border being galeate, with winged margins, and surmounted by a single terminal, delicate, oblong lobe, while the other lip is furnished internally with a prominent ringent palate, and has four distinct, terminal, oblong lobes, of delicate texture, like that of the other lip; these five lobes have all the same common induplicate æstivation. The style is quite glabrous, and declinate at the summit, and the stigma is deficient of the singular indusium of the *Goodenoviaceæ*, although it has a few external setose hairs, as in the *Campanulaceæ*; it is subsequently glabrous, bilabiate, with fleshy reflexed lobes, and a small gland in the sinus; indeed, it

PLATE XXIII.

Exhibits *Petunia parviflora*. *Fig.* 1, a flower. *Fig.* 2, the corolla, seen in front. *Fig.* 3, ditto, seen sideways, to show its half-formed palate. *Fig.* 4, the border, seen from above. *Fig.* 5, a transverse section of the tube across the palate, showing the stamens. *Fig.* 6, the corolla, cut open; *all magnified.* *Fig.* 7, one of the four longer stamens with declinate anthers, before and after dehiscence. *Fig.* 8, the shorter fifth stamen, with erect anther. *Fig.* 9, the stigma, with a portion of the style, seen sideways and from behind. *Fig.* 10, the ovarium, with the calyx cut open to show the supporting glandular disc; *all more highly magnified.* *Fig.* 11, the capsule, with persistent calyx; *natural size.* *Fig.* 12, the capsule, *magnified.* *Fig.* 13, a seed. *Fig.* 14, a longitudinal section of ditto. *Fig.* 15, the embryo extracted, seen in both directions; *all highly magnified.*

PLATE XXIV.

A, is *Petunia elegans*. *Fig.* 1, the calyx. *Fig.* 2, the corolla; *both natural size.* *Fig.* 3, the corolla, cut open; *magnified.* *Fig.* 4, the stamens, before and after dehiscence. *Fig.* 5, the stigma, with a portion of the style. *Fig.* 6, the ovarium seated on its glandular disc. *Fig.* 7, longitudinal section of ditto; *all more highly magnified.* *Fig.* 8, the capsule, with its persistent calyx; *natural size.* *Fig.* 9, the capsule after

dehiscence; *magnified.* *Fig.* 10, a seed. *Fig.* 11, vertical section of ditto. *Fig.* 12, the embryo extracted, seen in both directions; *all more highly magnified.*

B, is *Petunia ovalifolia.* *Fig.* 13, is the capsule after dehiscence; *magnified.*

PLATE XXV.

Shows *Sclerophylax spinescens.*

Fig. 1, a portion of a branchlet, with two flowering axils. *Fig.* 2, a single flower; *both natural size.* *Fig.* 3, a flower before expansion. *Fig.* 4, the calyx. *Fig.* 5, the corolla expanded. *Fig.* 6, ditto, cut open. *Fig.* 7, stamens, before and after dehiscence. *Fig.* 8, the pistil; *all magnified.* *Fig.* 9, the stigma, with a portion of the style; *more highly magnified.* *Fig.* 10, an axil, showing the manner in which the seed vessels of the two flowers become embedded in its fleshy substance. *Fig.* 11, the persistent calyx, when not absorbed in the axillary node; *both natural size.* *Fig.* 12, two views of the enlarged and persistent calyx, entirely enclosing the seed-vessel, with a portion of the style exserted. *Fig.* 13, vertical section of ditto. *Fig.* 14, the carcerule. *Fig.* 15, vertical section of ditto, showing a seed suspended from near the summit of each cell. *Fig.* 16, upper half of the carcerule, cut away to show the seeds, each suspended by its respective funiculus. *Fig.* 17, ditto, with the seeds removed. *Fig.* 18, the seeds seen in two directions. *Fig.* 19, vertical section of ditto. *Fig.* 20, embryo, seen in two positions, with the albumen taken away; *all magnified.* *Fig.* 21, a leaf, showing its flexuose nervures; *natural size.*

PLATE XXVI.

A, is *Sclerophylax Arnottii.*

Fig. 1, a flower in bud, *natural size.* *Fig.* 2, the calyx; *magnified.* *Fig.* 3, one of the segments of the calyx, showing its venation; *more highly magnified.* *Fig.* 4, the corolla before expansion. *Fig.* 5, ditto, cut open; *both magnified.* *Fig.* 6, one of the hairs of the corolla; *very highly magnified.* *Fig.* 7, a portion of the stamens, before and after dehiscence. *Fig.* 8, the stigma and part of the style; *both magnified.* *Fig.* 9, transverse section of the carcerule. *Fig.* 10, vertical section of ditto, showing the seed suspended in each cell; *both magnified.*

B, is *Sclerophylax Gilliesii.*

Fig. 1, is one of the axils, with its geminate flowers; *natural size.* *Fig.* 2, ditto, *magnified.* *Fig.* 3, the calyx. *Fig.* 4. portion of a stamen, *both much magnified.* *Fig.* 5, pollen grains, seen in different directions; *very highly magnified.* *Fig.* 6, the stigma, with a portion of the style. *Fig.* 7, an axil, with the two seed-vessels imbedded in its fleshy substance. *Fig.* 8, a carcerule extracted. *Fig.* 9, a seed; *all natural size.* *Fig.* 10, vertical section of carcerule, with the seeds removed. *Fig.* 11, horizontal section of ditto. *Fig.* 12, a seed with its funiculus in two positions. *Fig.* 13, embryo extracted, seen in front and sideways; *all magnified.*

PLATE XXVII.

A, is a young plant of *Cyphocarpus rigescens*, to show its nearly radical leaves, which soon disappear. *B*, is the same plant at maturity, having lost all its leaves.

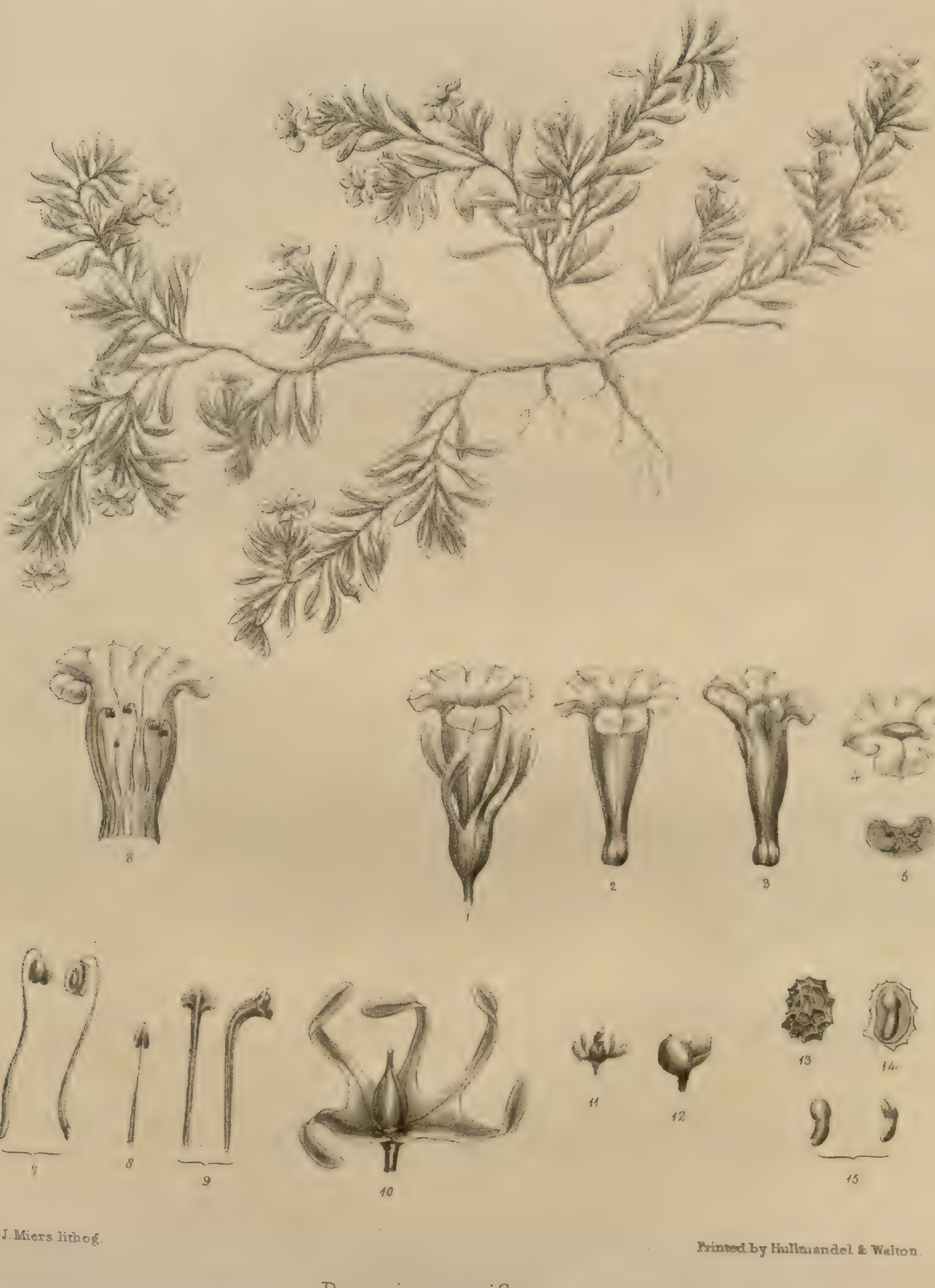
Fig. 1, is a flower in bud with its three bracts; *natural size.* *Fig.* 2, ditto, *magnified.* *Fig.* 3, the corolla of ditto expanded. *Fig.* 4, ditto cut open, to show its internal structure; *more highly magnified.* *Fig.* 5, pistillum with its front portion removed, showing the dissepiment beginning to separate from the sides of the ovarium. *Fig.* 6, the epigynous disc removed from ditto; *both magnified.* *Fig.* 7, the stigma before the expansion of the flower. *Fig.* 8, ditto after its impregnation; *both more highly magnified.* *Fig.* 9, transverse section of ovarium. *Fig.* 10, longitudinal section of ditto, with the calycine lobes removed, showing the epigynous disc surrounding the base of the style. *Fig.* 11, ditto with the persistent calycine lobes and corolla, with the dissepiment contracted, and the central placenta divided into two parallel ribbands. *Fig.* 12, ditto with the dissepiment contracted to a single narrow central line of placentation, the more usual occurrence, *all magnified.* *Fig.* 13, a seed. *Fig.* 14, vertical section of ditto. *Fig.* 15, the embryo extracted from the albumen, and seen in two directions; *all more highly magnified.*

PLATE XXVIII.

A, is a branchlet of *Salpichroma hirsuta*, with its flower and its berry; *natural size.*

B, is a portion of *Salpichroma diffusa.*

C, ditto of *Salpichroma tristis.*



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Petunia parviflora.

Petunia ovalifolia.

Petunia elegans.

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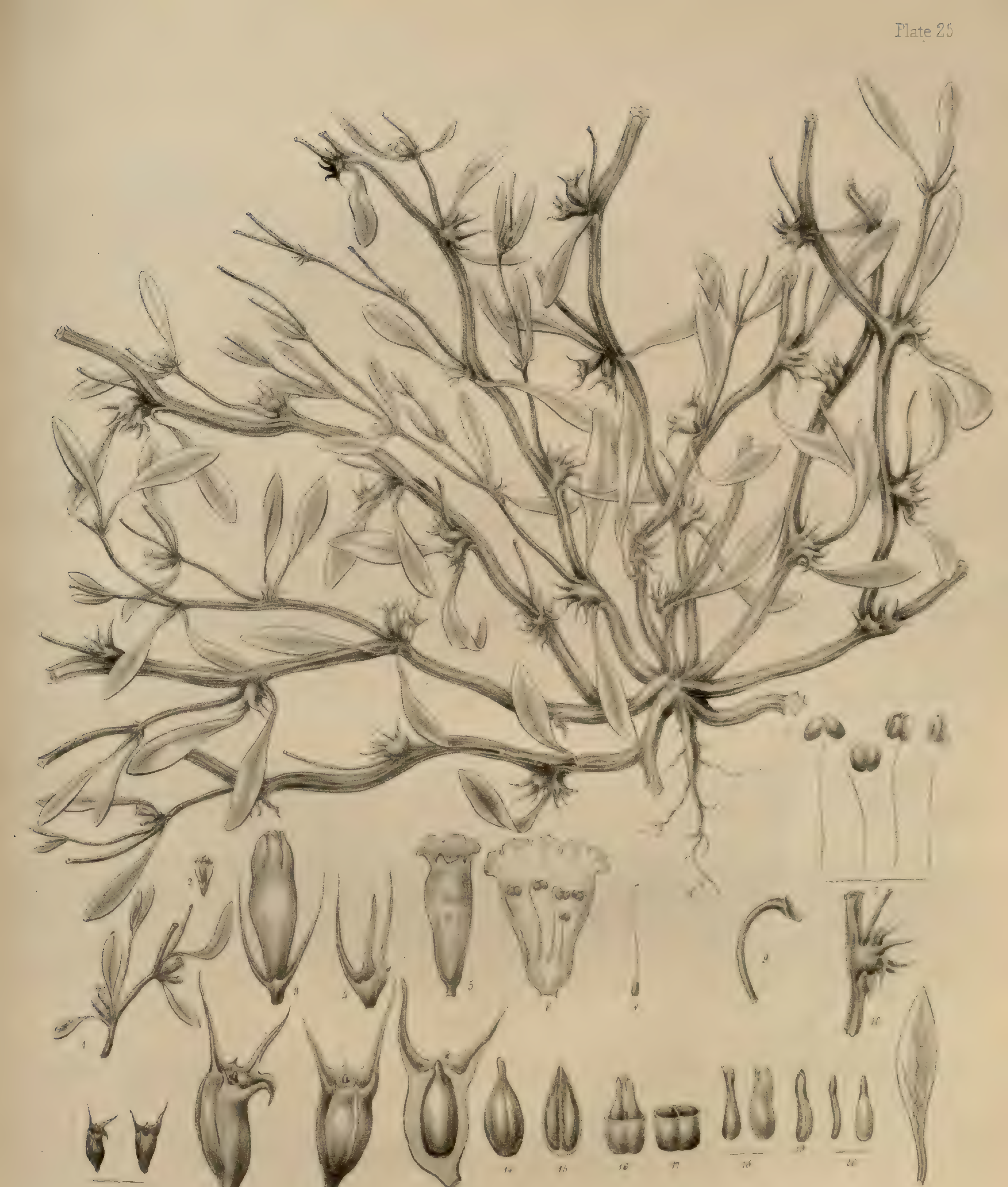

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Scierophylax spinescens

Sclerophylax Armouri

Sclerophylax Gilliesii

Printed by Hullmandel & Walton

A
B
9
10
11
12
13
14
15

A

Salpichroma linearis.

B

Salpichroma tristis.

Salpichroma diffusa.

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ILLUSTRATIONS

OF

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greatly resembles that of *Petunia*, and is much like the development of the stigma, which I have sometimes seen in the Chile variety of *Wahlenbergia linarioides*. It has an entire, small, annular, fleshy, epigynous ring, surrounding the base of the style, as in the *Lobeliaceæ*. Its seeds are neither lenticulate, nor winged, but oval and striated, with a somewhat scrobiculate and reticulated testa. Its general habit is very peculiar, being somewhat herbaceous, of an arid appearance when dried, with small radical rigid leaves, having sharp spinose teeth, while its cauline leaves are ternate, involucrating, and surrounding the base of a solitary sessile flower in each alternate axil, the two lateral ones being actually inserted upon the ovarium; these resemble in form the persistent segments of the calyx, being linear and rigid, with a few somewhat retrorse teeth on the margin, which are hard and spinescent, and sometimes double. In the ascendant position of its ovules, and in the form and direction of the embryo, it resembles all the other orders of the Campanal alliance.

It must be evident from the above facts, that the affinity of *Cyphocarpus* is unquestionably with the class of the *Campanulineæ*, but it cannot obtain a tenable place in any of the five orders composing that class,* for which reason I would rather suggest the propriety of giving it a distinct station, and making it the type of an aberrant group, of which, probably, many others remain to be discovered, or may now, perhaps, be found in existing herbaria. It certainly borders closely upon *Campanulaceæ*, through *Prismatocarpus*; upon *Lobeliaceæ*,† through *Grammatotheca*, *Clintonia*,

* If in any place, it would certainly stand as a third tribe of the *Campanulaceæ*, but in an instance like the above, where a plant osculates closely upon several different orders and cannot be arranged in any one of them, without breaking down the few limits of demarcation between very natural families, it appears to me less objectionable to classify it under a distinct title, as a separate group, than to force it into an unnatural position. This genus may therefore remain for the present, as the nucleus of a suborder, attached to the class *Campanulineæ*, after the example of the *Sphenocleaceæ*, until other analogous plants be detected, that may claim for the *Cyphocarpaceæ* its due place, as a recognized family in the Natural System.

† I have noticed in many of the Cape species of *Lobelia* a very distinctly gibbous palate, similar to that described in *Cyphocarpus*; but strange to say, I can find nowhere, either in the descriptions, or in the figures of any botanical work, any

and *Lysopomia*; upon *Cyphiaceæ*, through the genus *Cyphiella* of Presl, which has a gamopetalous corolla; and upon *Goodenoviaceæ*, through the section *Ochrosanthes* of *Goodenia*.

The generic name of *Cyphocarpus*, now proposed for this plant, is derived from κυφος, *incurvus*, and καρπος, *fructus*, on account of the gibbous form of its enlarged capsular fruit.

The following is an outline of its generic character :—

Cyphocarpus. (gen. nov.)—*Calyx* oblongus, ovario adnatus, limbo supero, persistenti, breviter tubuloso, profunde 5-fido, laciniis erectis, subinæqualibus, linearibus, retrorsim mucronato-dentatis, rigidis, fructifer demum auctus. *Corolla* persistens, insertione epigyna, longe tubulosa, tubo cylindrico pentagono, angulis hispidulis, limbo bilabiato tubo duplo breviore; labio superiore galeato, textura crassiori, (excepto nervo dorsali) glabro, colorato, marginibus alatis tenuibus, lobo unico oblongo superato; labio inferiore, imo in palatum gibbosum plicato, plicis 3 linearibus intus prominentibus, apice usque ad medium in lobis 4 oblongis partito; lobis omnibus 5 textura delicatula æqualibus, æstivatione induplicatis. *Stamina* 5, æqualia, inclusa, supra medium tubi inserta, limbi laciniis alterna: *filamenta* gracilia, dilatata, medio nervulo centrali barbata: *antheræ* lineares, filamentorum longitudinis, basifixæ, 2-loculares, loculis collateralibus, margine rima longitudinali dehiscentibus. *Pollen* globosum, simplex. *Ovarium* inferum, cylindraceum, sub-5-gonum, membranaceum, 2-loculare, loculis uno antico, altero postico, dissepimento membranaceo, tenuissimo, medio placentifero, a parietibus cito soluto et evanido, placenta centrali tunc omnino libera, revere deinde uniloculare: ovulis plurimis adscendentibus. *Stylus* filiformis, tubo corollæ paulo longiusculus, omnino glaber, apice sub galea reflexus, basi annulo brevi integro carnoso cinctus. *Stigma* capitato-bilobum, lobis crassis, in alabastro clausis et extus setosis, demum reflexis, glabris, in sinu glandula centrali viscosa instructum. *Capsula* cylindrica, conica, striata, postice gibboso-ventricosa, corolla calycisque laciniis foliaceis persistentibus coronata, unilocularis, subfolli-

allusion to the existence of so prominent a feature. I have also observed in some species of *Lobelia*, that the insertion of the stamens is decidedly perigynous, that is to say, upon the tube of the corolla, a little above its base, not epigynous, as generally described.

cularis, vel sutura longitudinali postice dehiscens, placenta nunc omnino soluta, in tæniam angustissimam centralem liberam seminigeram (rarius medio fissam) cum stylo persistenti continua. *Semina* plurima (circiter 40), patentia vel suspicientia, breviter stipitellata, ovata; *testa* longitudinaliter costata, reticulato-scrobiculata, apice chalaza subobsoleta notata; *albumen* carnosum: *embryo* axilis, teres, fere orthotropus, radicula terete, infera, hilo spectanti, cotyledonibus ovalibus paulo latioribus, multoties longiore.

Herba Chilensis *rigida, per totam scabrido-pilosula*, caulibus *perpaucis, e collo ramosis, erectis*. Folia *fere radicalia, oblonga, acuminata, basi in petiolum decurrentia, enervia, grosse spinoso-dentata*: folia caulina, *terna, æqualia, sessilia, quarum 2 lateralia* (bracteæ) *e basi ovarii utrinque orta, rigida, linearia, spinoso-dentata, florem solitarium sessilem involucrantia, persistentia*; *caulibus tunc* in inflorescentiam *quasi spicatam redactis*.

1. Cyphocarpus *rigescens*: foliis radicalibus oblongis, grosse dentatis, dentibus mucronato-spinulosis rachi marginibusque cartilagineis, rigidis, in petiolum decurrentibus, mox caducis, caulinis bracteisque consimilibus linearibus, laciniisque calycinis runcinato-dentatis, rigidissimis, persistentibus; ramulis subspicatis, subflexuosis, e basi ortis, adscendentibus. Chile (Coquimbo): *v. s. in herb. Hooker et Mus. Brit.* (Bridges, n. 1293.)

This curious plant seems to be quite herbaceous in its habit, although of arid and harsh appearance: its root is long, slender, and tapering: it branches from towards its base into a few nearly erect, somewhat flexuose floriferous stems about a foot high, bearing a single flower in each axil. The radical leaves, including the petiole, are eleven lines long, and three broad: the floral leaves and bracts are nine lines long, and about a line broad: the calycine leaflets in flower, are four lines long, and scarcely a line broad, but they increase in length to six lines upon the ripened and enlarged capsule: the inferior ovarium is three lines, and the superior corolla six lines long; this is persistent, although the border becomes shrivelled; it is, apparently, of a bluish hue, but the upper galeate lip is of a deep crimson colour, and the palate of the opposite lip seems of a roseate tinge, judging at least from

the appearance of the flower when moistened after being dried; externally it is quite smooth in bud, but the flower, at maturity, is covered with a very short, dense, echinate, rigid pubescence, with which, indeed, the whole plant, under the lens, will be found to be more or less invested: the crimson galeate lip of the corolla, with the exception of the dorsal nerve, is, however, quite glabrous.

DORYSTIGMA.

I am indebted to the kindness of Dr. Lindley for allowing me to examine and define several of the following Solanaceous plants, and I take this opportunity (April, 1848,) of repeating my obligations to Sir William Hooker for his liberal and kind permission to describe the many following new species which, during the last twelve months, I have found in his rich and extensive Herbarium.

In the *Jaborosa* group, and belonging to the genus above mentioned, whose elements were defined in a former portion of this work, p. 27, I have now to add a third species.

3. Dorystigma *crispum*, n. sp.; caulibus plurimis, cæspitosis; foliis subfasciculatis, glaberrimis, carnosulis, irregulariter pinnatifido-laciniatis, in petiolum longum alatum decurrentibus, laciniis latis brevibus, mucronato et sinuoso-dentatis, uninerviis, eveniis, sinubus crispato-undulatis, margine subrevolutis; floribus cum foliis in collum fasciculatis, bracteis parvis, subulatis; corolla extus imo glabra, superne pubescente, intus fauce lanuginosa, limbi laciniis oblongis, obtusis, staminibus fere exsertis. — Bolivia *v. s. in herb. Lindley.* (*Bridges*, 1846.)

This plant has very much the habit of the two species formerly described, the leaves much resembling those of *Dorystigma squarrosum*, (see p. 28, Plate 6), being nine lines broad, the petiole is one inch and a quarter, the blade one inch and three quarters, altogether three inches long; the peduncles six lines, and the corolla six lines in length.

SALPICHROMA.

In order to harmonize better with the names of the two ap-

proximate genera, *Iochroma* and *Pœcilochroma*, I propose to substitute that of *Salpichroma* for *Salpichroa*, the genus described in the beginning of this work p. 1. The plants from Columbia and New Grenada, there alluded to in p. 6, I now find to belong to a new species, very distinct from Dr. Meyen's *Atropa hirsuta*, of which I have since seen an original specimen. The number of species, to which I have still to add another, will therefore stand as follows.

§. Eusalpichroma	1.	Salpichroma	*glandulosa*, loc. cit.
	2.	„	*dependens*, ib.
	3.	„	*hirsuta*, infra descrip.
	4.	„	*ramosissima*, loc. cit.
	5.	„	*diffusa*, n. sp. infra descr.
	6.	„	*tristis*, n. sp. infra descr.
§. Perizoma	7.	„	*rhomboidea*, loc. cit.
	8.	„	*ciliata*, ib.

3. Salpichroma *hirsuta*. Atropa hirsuta, *Meyen*. (*Riese em die Erde*, vol. i. p. 466. *Nees ab Esenb. Nov. Act.* 19. *Suppl.* 1. p. 389): caule suffruticoso, ramosissimo, diffuso, ramulis molliter hirsutis; foliis alternis vel in turionibus fasciculatis, ovatis, basi obtusis, inæqualibus, apice acutiusculis, utrinque pilis articulatis sparse hirsutis, longissime petiolatis, petiolo complanato, tenuissimo, ciliato, limbo 3 vel 4-plo longiore; pedunculo capillari petiolo breviore; calyce hirsuto, profunde 5-partito, laciniis lineari-subulatis, erectis; corolla longe tubulosa, extus pilosula, tubo imo gracili, superne infundibuliformi, calyce 4-plo longiore et petiolo æquilongo, antheris styloque sub-exsertis; bacca ovalis, calyce persistente suffulta.—Peruvia, circa Pisacomam, altit. 15,000 ped. —*v. s. in herb. Hooker* (Atropa hirsuta, *Dr. Meyen*).

The specimen above referred to, being named by Dr. Meyen himself, leaves no doubt as to the identity of the species, so that in accordance with it, I have given the above amended diagnosis. Nees v. Esenbeck describes the plant as being much branched but the specimen here referred to, consists only of a small single branchlet, which is slender, with alternate distant leaves, the blade being about nine lines long, and six lines broad, the petiole almost

filiform, measuring sixteen lines, and the peduncle eight lines, the calyx four lines, the tube of the corolla sixteen lines, with five reflexed, short, ovate segments of one line and a half; the berry is about seven lines long and four lines diameter.*

5. Salpichroma *diffusa*, (n. sp.) : caule suffruticoso, ramosissimo, divaricato-flexuoso; foliis geminis, ovatis, basi obtusis, apice subacutis, utrinque pilis articulatis hirsutulis, margine floccoso, petiolo dilatato limbo breviore; floribus solitariis, breviter pedunculatis, calyce 5-partito, hirsuto, laciniis linearibus; corolla subbrevi, infundibuliformi, tubo nullo modo gracili, ore subcoarctato, calyce 2-plo, aut vix 3-plo longiore, extus pubescente, limbi laciniis oblongis, obtusiusculis, reflexis, margine ciliatis, genitalibus inclusis.—America occidentalis intertropica.—*v. s. in herb. Hook.* Nova Grenada (Bogota, *Goudot*), Quito (Lloa, *Jameson*, No. 301), (Pichincha, *Jameson*, No. 32), Andibus Peruvianis, (*Mc Lean.*)

The above named plants are those which I had referred, on the occasion before quoted, to the species last described, they will, however, be seen to be evidently different: their leaves measure nine lines in length, seven lines in breadth, the petiole being about four lines, the peduncle and calyx each three lines, the tube of the corolla six lines, and its border about two lines.†

6. Salpichroma *tristis*, (n. sp.) : humilis, suffruticosa, ramis flexuosis, subdichotomis, nudis, striato-rugosis, ramulis tenuissimis, brevibus; foliis geminatis minoribus, obovatis, apice subacutis, basi obtusatis, in petiolum planum caniculatum decurrentibus, carnosulis, eveniis, utrinque glanduloso-pubescentibus; floribus solitariis, pedicellatis, nutantibus: calyce subglabro profunde 5-partito, laciniis lineari-subulatis, acutis; corolla tubulosa, tubo imo latiore glabro, staminibus styloque inclusis glabris. —Quito. *v. s. in herb. Hook.* (Andibus Peruvianis, *Mc Lean.*) (Andibus Quitensibus, *Jameson*, No. 125.)

Having seen other specimens of the above plant, I am now enabled to offer it as a very distinct species. It appears to be a very diminutive shrub, of stunted Alpine growth, with short tor-

* This species is delineated in Plate 28, A.

† This plant is figured in Plate 28, B.

tuose knotty branches, and only a few inches in height; it throws out a few leaf-bearing branchlets as slender as the petioles, from half an inch to an inch in length, each exhibiting about three pairs of geminate leaflets, giving them much the appearance of being a pinnated leaf: the leaflets are two lines and a quarter long, and one line and a half broad, upon a channelled, flattened petiole, one line and three quarters in length: the calyx is cleft nearly to the base, into five, equal, narrow, subulate segments, two lines long: the tube of the corolla is about five lines long, one line and a half in diameter, with five short triangular reflexed teeth: the stamens arise from the middle of the tube, and are not exserted: the ovarium is conico-ovate, seated upon a thick, fleshy ring: the style is somewhat curved at the apex, and thickened towards the stigma, which is hollow, with an obsoletely bilobed margin. Both the leaves and flowers become quite black in drying, a peculiarity noticed upon a former occasion in other species of this genus: the bark of the woody branches is greyish, finely shagreened with raised dots.*

LYCIOPLESIUM.

To this genus, proposed in this work (Note) p. 10, I have now to add another species.

6. Lycioplesium *fasciculatum*, (n. sp.): spinosum, ramulis subflexuosis, fere rugosis; foliis alternis, vel in axillas fasciculatis, oblongo-spathulatis, glabris, carnosulis, nervis pinnatis immersis, basi in petiolum subbrevem spathulatis, apice obtusis; floribus in medio spinarum binis, vel ex apice cum foliis plurimis enatis, verticillato-fasciculatis, pedunculis calyceque subpubescentibus; corollæ tubo brevi, summo campanulato, extus pubescente, limbo profunde 5-partito, lobis expansis, margine albido-floccosis, staminibus styloque exsertis.—Bolivia (*Bridges Collect.* 1846.)

This shrub very much resembles in habit the five species formerly described; the spines are from six to nine lines long, the leaves (including a petiole of three lines) are one inch and a

* For a figure of this species see Plate 28, C.

quarter long, and five lines wide, they are of a bright green colour, somewhat thick and fleshy, smooth on both sides, and above are quite polished; the peduncles are half an inch long, the calyx is two lines, the corolla, including the lobes of the border, is from six to eight lines in length.*

DUNALIA.

On a preceding occasion p. 13, I offered an amended character of this genus, founded upon the observations made upon a new species very remarkable in its habit, which is there described (p. 14), and figured in Plate 2. Since then, in the fine herbarium of Sir William Hooker, which is enriched with the collections of almost every South American traveller, I have seen a specimen of the typical species, D. *Solanacea*, *H.B.K.* of which an excellent figure is given by Professor Kunth in the Nov. Gen. et Sp. tab. 194; but in this instance, the whole plant is not almost glabrous, as is there represented: on the contrary, the stem, the petiole, and the under side of the leaves, are covered with stellate tomentum, which is also seen in the nervures of their upper surface; the flowers, in like manner, are densely clothed with similar tomentum. I find, too, that the tube of the corolla is not so slender, nor is the border so deeply cleft as there shown, being more sinuated with shorter and more obtuse lobes, approaching more the form seen in D. *Lycioides* (loc. cit.) The difference in habit of these two species is very remarkable, and from their external appearance, in one case, the peculiar pubescence, its large leaves, its spineless branches, its dense fascicle of flowers, offer so great a contrast to the general habit of the other, that no one would pronounce them to belong to the same genus. I have now to add three new species, two very spinose, from Bolivia, and one, almost spineless, from Mexico, the latter being remarkable for the greater size of its corolla. It might, indeed, be easily mistaken for a species of *Iochroma*, were it not for its appendiculate filaments and smaller calyx.

* This species, with sectional details, is shown in Plate 29.

An examination of *Dunalia acnistoides* will show how very intimately *Dunalia* is allied to *Acnistus*. In the latter genus, the filaments are generally flattened below the middle, and gradually expanded towards the point of insertion, and if we conceive the dilated margins to become split, or torn away from the central portion, we should find an *Acnistus*, thus, at once, converted into a *Dunalia*: there appears to me, indeed, no other difference between this and the typical species, where the flowers are numerously aggregated, and *Acnistus*; in the other spinescent species, where the flowers are few or solitary, the dissimilitude in habit is very remarkable. On this account it will probably be desirable to divide *Dunalia* into two sections:—1st. CONFERTIFLORÆ, containing 1. D. *solanoides*; 2. D. *acnistoides*; and 2nd. PAUCIFLORÆ, containing 3. D. *lycioides*, 4. D. *brachyacantha*, 5. D. *senticosa*, and 6. D. *ramiflora*, enumerated below.

§. CONFERTIFLORÆ.

2. Dunalia *acnistoides*, (n. sp.): inermis, ramis striatis, glaberrimis; foliis alternis, (floriferis geminis vel ternis,) elliptico-oblongis, acutiusculis, imo in petiolum longum gracilem caniculatum attenuatis, utrinque glaberrimis, supra glanduloso-pruinosis, subtus pallide glaucis, rachi prominente nervisque pinnatis rubentibus: floribus in axillis superioribus plurimis (circiter 20), fasciculato-aggregatis, petiolo æquilongis, pedunculis filiformibus calyceque glabris, corollæ tubo glabro calyce 4-plo longiore, lobis brevibus, extus tomentosis; staminibus inclusis, infra medium insertis, appendicibus filamento glabro tertio brevioribus, imoque tubi pubescentibus; stylo glabro vix exserto.—Huanaco, Peruviæ. *v. s. in herb. meo* (Mathews, No. 849, "*Lycium spathulatum*" *dicta*).

This plant so exactly resembles an *Acnistus*, and possesses so little the appearance of a *Dunalia*, that I did not doubt the correctness of Mathews's decision when on a former occasion I referred it to *Acnistus spathulatus* (ante. p. 22.). Although much resembling in habit the *Lycium spathulatum* of the Flora Peruviana, its violet coloured flowers are far more numerous,

and considerably smaller than in that species. Its leaves are three inches long, and one and a quarter broad, on a slender caniculate petiole three quarters of an inch long; the peduncle is about six lines, the calyx one line in length, tubular, obsoletely five-toothed, the corolla is four lines long, slender at base, slightly infundibuliform above, with lobes somewhat expanded, tomentose outside, and on the margin, half a line long and broad, without any intermediate tooth in each sinus: the filaments are one line and a quarter, the appendices two-thirds of a line, and the anthers half a line long.

§. Paucifloræ.

4. Dunalia *brachyacantha*, (n. sp.) : fruticosa, spinosa, glaberrima, ramis vix flexuosis, spinis nudis, brevibus; foliis in axillis fasciculatis, in turionibus alternis, oblongis, in petiolum elongatum tenuem spathulatis, obtusis, utrinque glabris, supra lucidis, subtus flavescenti-pallidis, pinnato-nervosis, marginibus subrevolutis; floribus sub-ternis, pedunculis 1-floris, gracilibus, calyce glabro, curte tubuloso, membranaceo, 5-nervio, breviter 5-dentato; corolla violacea, longe tubulosa, limbo angusto, breviter 5-lobo, marginibus floccosis, lobis triangularibus, apice callosis, dentibus rotundatis glabris in sinubus interjectis: staminibus inclusis. —Bolivia. *v. s. in herb. Lindley* (*Bridges Coll.*, 1846).

This species, although very distinct from D. *lycioides*, much resembles it in its spinescent and glabrous habit; it has straighter branches, much shorter spines, and larger leaves: its stem is smooth, angular, and is marked with many small verrucose spots: its spines are only four lines long, its leaves, exclusive of the petiole, are two inches and a half long, and one inch broad, the petiole measuring seven-eighths of an inch: the peduncle is nine lines long, the calyx being two lines in length, and one line and a half in diameter: the stamens arise from a contraction of the tube, a little above its base, and are adnate to it by their central nerve for the length of two lines, leaving the winged margins quite free; from this point they become altogether detached and trifid, the filament being capillary, and four or five lines long, the appen-

dages, which form a continuance of the winged margins, being subulate, scarcely a line in length, and erect. The style is much longer than the stamens, equalling the length of the corolla, and is thickened towards the apex. The berry not yet ripe (as seen in the specimen quoted), is three lines in diameter, supported on the persistent membranaceous calyx. I regret that the seeds were not sufficiently matured to determine the form of the embryo.

5. Dunalia *senticosa*, (n. sp.): ramis spinosis, tortuosis, vix flexuosis, substriatis, rugosis: foliis parvis, oblongis, in petiolum brevem spathulatis, obtusis, glabris, carnosulis, utrinque pallide virescentibus: floribus solitariis, vel binis, uno præcociore; calyce brevi, 5-gono, mucronato-dentato; corolla violacea, longe tubulosa, limbo versus apicem pubescente, breviter sinuato-5-lobo, lobis 3-angularibus, callosis, margine tomentosis, dentibus longis interjectis; staminibus inclusis, inæqualibus.—Bolivia. *v. s. in herb. Lindley.* (*Bridges, anno* 1846.)

The spines in this species are one inch in length, the leaves (including a short petiole of two lines) are one inch long, and three lines broad; the peduncle is thickened at the apex, and five lines long; the calyx is one line and a half in length, and diameter; the corolla is an inch long, and its tube two lines in diameter, the stamens are included, two of them being rather longer than the others, the lower half of the filaments adhering by a central nerve from the base to nearly half the length of the tube of the corolla, the two free-winged margins of which are also terminated by long subulate teeth, a little more than a line long, as in both the former species, and in D. *Lycioides*, the anthers are also basi-fixed, and of a purplish colour: those of the two longer stamens are within the mouth of the corolla, the others a little below: the style is included, and of the length of the stamens.

5. Dunalia *ramiflora*, (n. sp.): fruticosa, obsolete spinosa, ramis striatis, glaberrimis; foliis apice ramorum fasciculatis, aut ex axillis annotinis solitariis, vel geminis, oblongis, in petiolum elongatum caniculatum tenuem spathulatis, obtusiusculis, utrinque glabris, subtus pallidioribus, margine sub-revolutis, nervis flexuosis; floribus axillaribus, præsertim in annotinis solitariis, rarius binis;

pedunculis gracilibus, 1-floris ; calyce brevi, campanulato, 5-nervio, dentibus 5, obtusis ; corolla majuscula, virescente, tubo elongato, infundibuliformi, glabro, intus imo tomentoso, limbo brevissimo, campanulato, ciliato, 5-angulato, angulis acutis, dentibus brevibus obtusis glabris interjectis, staminibus inæqualibus, tubo multo brevioribus ; stylo longe exserto.—Mexico. *v. s. in herb. Hook.* (*Galeotti*, No. 1145, *Vera Cruz, in uliginosis alt.* 500 *ped.*)

This very distinct species is enumerated among Galeotti's Mexican plants (Enum. Acad. Reg. Brux. tom. xii. Bull. No. 2.) under the name of "*Nicotiana plumbaginifolia*? Wild," and is said to be found also near Jalisco, in the Province of Guadalaxara, at an elevation of from 3,000 to 5,000 feet, and at Juquila, near the coast at Oaxaca, on the borders of the Pacific, at the same elevation. The specimen consists of a simple, erect, and nearly straight stem, with internodes of three quarters of an inch distant ; these mostly exhibit large cicatrices of the fallen leaves of the previous year, and above these arise, generally, a pair of recent leaves, and a solitary pendent flower : at the termination of the branch, the axils become closer, the leaves and flowers more fasciculated : only a single rectangular spine is here seen, which is half an inch in length : the leaves are quite spathulate, one inch and three quarters long, in addition to the caniculate petiole of half an inch in length, into which they are gradually attenuated ; they are six lines and a half wide at the broadest part near the summit, are quite glabrous, marked with about five pairs of nervures, which are remarkably flexuose : the peduncles are one inch and a quarter, to one inch and a half long, very slender, but thickening towards the apex, and quite glabrous ; the calyx is small, campanular, two lines long, membranaceous, with five prominent nerves, and five short rounded teeth, marked on the edge with a marginal nerve ; the corolla is one inch and a half long, contracted for about three lines at the base, and thence slightly infundibuliform, spreading into a short campanular mouth tomentose outside, with a pentangular ciliate border, the angles being acute, and exhibiting in the plicature of the sinus, a prominent, glabrous, rounded tooth ; the filaments arising from the upper part of the contraction of the

tube, are unequal, varying from six to nine lines in length, the lateral appendices are scarcely more than two lines long; the number of stamens I have found to be eight in one instance, and four only in another, with a sterile fifth, but these, no doubt, are the result of irregularity; the lower part of the filaments are very woolly for about three lines in length, above which they are slender, terete, and glabrous, the anthers are erect, the ovarium is small, and the style, almost capillary, thickening slightly towards the apex, is from two to six lines longer than the corolla.

IOCHROMA.

A very pretty Solanaceous shrub with long purple flowers, now well known in our gardens, was first noticed by Mr. Bentham, and was selected by that distinguished botanist as the type of a new genus, under the name of *Iochroma tubulosa*: with this, he at the same time, associated two other species, and I subsequently added another, evidently congeneric with these two plants last-mentioned, I. *macrocalyx*, Hook. *huj. op.* p. 19, and *Lond. J. Bot.* iv. p. 309, where an excellent figure of this was at the same time kindly contributed by Sir William Hooker. At the period when I described the plant last alluded to, I had not seen the *Iochroma tubulosa*, Benth., or I should then have hardly ventured to propose the genus *Chænesthes*, for the plants there described under that name. By the kindness of Dr. Lindley, I was furnished, last year, with a living specimen of *Iochroma tubulosa*, in flower and in fruit, and am now therefore prepared to compar the relation of this typical species with other analogous plants. Subsequent observations upon this group have led me to the conclusion, that all the plants which I formerly associated under the name of *Chænesthes*, differ but little from the typical species last alluded to, being only distinguished by an occasional splitting of the persistent calyx in fruit, and by their flowers being always scarlet or of a deep orange colour, instead of a dark purple: they have all, the same long, tubular corolla, spreading very little in the mouth into a very short campanular border, which is almost entire,

and furnished with five very short teeth: the stamens and pistillum are all alike in structure, and I perceive no difference in the fruit or seed. *Chænesthes*, therefore, as a genus, must verge into that of *Iochroma*, a name that ill accords with a scarlet corolla, but one that must remain on the score of priority. I suggest, however, the propriety of dividing the genus into two sections, one *Iochroma* proper, with a purple or greenish corolla, the other *Chænesthes*, with red and orange flowers. To both these sections I will here add several new species, proposing, hereafter, to illustrate by appropriate figures, the structure of each section respectively. The three plants first alluded to, I propose to separate from *Iochroma*, under the name of *Cleochroma*, for the reasons stated under that head (p. 147.) Dr. Walpers (*Repert.* vol vi. p. 629) refers *Iochroma* to the tribe *Cestrineæ*, and in a note (*ibid*, 620) says it hardly differs, as a genus, from *Cestrum*. This statement I cannot in any degree confirm; on the contrary, after a careful analysis, on which the following generic character is founded, it will be seen that *Iochroma* most unquestionably belongs to the tribe *Solaneæ*.

Iochroma, Bth. (Bot. Reg. vol. xxx. tab. 20.) *Calyx* ovato-tubulosus, subinflatus, submembranaceus, 5-dentatus, dentibus inæqualibus, interdum fere obsoletis, demum parum auctus, persistens, et in fructus grossificatione sæpe lateraliter hinc fissus. *Corolla* tubulosa, calyce 4–6-plo longior, medio subincurva et subdilatata, limbo brevissimo, vix expanso, æstivatione plicato, margine pene integro, floccoso, dentibus 5, minimis, rotundatis, et alteris 5 quasi obsoletis in sinubus intermediis notata. *Stamina* 5, subinclusa; *filamenta* teretia, paulo supra basin tubi inserta, imo crassiuscula, tomentosa, superne gracilia, glabra; *antheræ* oblongæ, 2-loculares, imo paulo discretæ, in sinu basifixæ, loculis parallelis coadunatis rima externa longitudinaliter dehiscentibus. *Ovarium* obovatum, imo disco annulari fere obsoleto cinctum, 2-loculare, ovulis plurimis, dissepimento incrassato, utrinque affixis. *Stylus* filiformis, apice paulo incrassatus, sæpissime exsertus. *Stigma* clavato-capitatum, emarginato–2-lobum. *Bacca* calyce membranaceo vesiciforme, interdum hinc fisso, inclusa, 2-locularis. *Semina* numerosa,

compressa, reniformi-rhomboidea, in pulpam tenuem nidulantia, testa scrobiculata. *Embryo* intra albumen carnosum fere annularis, filiformis, cotyledonibus semiteretibus, radicula paulo curvata, infera, ab hilo laterali declinante, æquilongis.

Suffrutices Americæ intertropicæ *indigenæ*; folia *alterna, petiolata, elliptica, integra:* flores *rarius axillares, bini, vel sæpissime è ramulo novello cymulam umbelliformam, primum terminalem, mox lateralem simulantes*; pedicelli *uniflori, elongati*; corollæ *longæ, speciosæ.*

§ I. IOCHROMA VERA: corolla dense purpurea.

1. Iochroma *tubulosa*, Bth. *Bot. Reg.* vol. xxxi. tab. 20. Habrothamnus cyanæus, *Lindl. Bot. Reg.* vol. xxx. *Misc.* p. 72: ramulis junioribus incano-pulverulentis: foliis ellipticis, utrinque acuminatis, subacutis, imo in petiolum decurrentibus, pulverulentis, superne demum parce pubescentibus, cymula 6–8-flore, calyce inflato, corolla profunde purpurea.—Loxa, in Andibus Ecuadorensibus. (Hartweg). *v. v. cult. et sic. in herb. Hooker.* (Loxa, *Seemann*, n. 883.)

This is described as a shrub, from four to six feet high. The leaves are three inches and a half long, one inch and three quarters broad, upon a petiole one inch in length. From six to eight flowers spring out of the apex of the branch, which subsequently increasing, leaves the fascicle finally axillary; the peduncle is ten to fourteen lines long, the calyx is four lines long, and the corolla, of a deep rich purple colour, is one inch and a quarter long, and two lines and a half in diameter, somewhat narrow in the mouth and base, the border very short, somewhat cup-shaped, being only four lines in diameter, when fully expanded: its margin is almost entire, tomentose, with five extremely short, almost obsolete, rounded teeth. The berry is oval, five lines long, three lines in diameter, enclosed in the scarcely enlarged ventricose, membranaceous calyx, and contains a number of small, flattened, rhomboidal seeds.

2. Iochroma *longipes*, (n. sp.): ramulis glabris; foliis ellipticis, utrinque acuminatis, longe petiolatis, undique glaberrimis, subtus

pallidioribus, margine subrevolutis; floribus speciosis, fasciculatis, longissime pedunculatis, glabris, pedunculo apice incrassato, corollæ tubo elongato, limbo brevissimo, subcampanulato, margine tomentoso, dentibus 5 minimis rotundatis cum alteris in sinubus notato, genitalibus exsertis; bacca oblonga, calyce persistente lateraliter fisso cincta, et duplo longiore.—Ecuador. *v. s. in herb. Hook.* in Vallem Lloæ (*Jameson*).

This plant has very much the habit of the preceding species, but it is altogether devoid of any pubescence. Its leaves are four inches and a half long, one inch and three quarters broad, upon a petiole from one inch to one inch and a half long; the peduncles are two inches and a quarter to two inches and three quarters long, thickening towards the apex; the calyx is tubular, quite smooth, unequally five-toothed, four lines long, and two lines and a half in diameter; the corolla, apparently purple, is one inch and a half long, three lines in diameter in the middle, somewhat contracted below, and in the mouth, terminating in a short cup-shaped, almost entire border, as in the last species, with five distant, small, rounded teeth, and with another short intermediate tooth in each sinus. The berry, apparently not quite ripe, is eight lines long, three lines in diameter, invested by the persistent calyx three lines long.*

§ II. Chænesthes: calyce in fructu lateraliter fisso: corolla coccinea vel aurantiaca.

The characters of the species before enumerated, are here revised upon more extended specimens.

3. Iochroma *fuchsioides*. Chænesthes fuchsioides, *Nob. huj. op. in Annot.* iv. p. 17. Lycium fuchsioides. *H. B. K. Nov. Gen.* vol. iii. p. 52. *Plant. Æquin.* vol. i. p. 147. tab. 42. *Bot. Mag.* tab. 4149. Frutex sesquiorgyalis: foliis obovato-oblongis, in petiolum gracilem attenuatis, obtusiusculis, subfasciculatis, glaberrimis: floribus umbellato-fasciculatis, axillaribus, terminalibusque, pedicellis glabris, elongatis, cernuis; calyce subgloboso, margine brevissime inæqualiter 5-dentato; corolla tubulosa, coc-

* A figure of this species, with sectional details, will be shown in Plate 30.

cinea, glabra, intus imo pubescente, staminibus inclusis, filamentis gracilibus imo incrassatis et tomentosis; bacca rubra, ovata, calyce aucto lateraliter fisso inclusa.—Columbia. *v. s. in herb. Hook.* Quito, in Vallem Lloæ (*Hall*, No. 7.) Cuenca, Novæ Grenadæ (*Jameson*). Loxa, regni Ecuadorensis (*Seemann*, *n.* 882.) Columbia, (*Lobb.*)

To the details of this species (huj. op. p. 17.) little more need be added. The corolla exhibits five short teeth with other intervening ones in the plicature of each sinus, as in I. *tubulosa*: the filaments are considerably thickened and densely tomentose at base: the berry is oblong, and very pointed, and is invested by the enlarged calyx, which splits on one side to the base. The form of the embryo is similar to that of the species just referred to.

4. Iochroma *umbrosa*. Chænesthes umbrosa, *Nob.* (huj. op. p. 18). Lycium umbrosum, *H.B.K.* vol. iii. p. 54. Arbor biorgyalis, ramulis angulatis, hirto-pubescentibus; foliis oblongis, acuminatis, glabriusculis, floralibus ovato-rhomboideis; floribus umbellato-fasciculatis, pedicellis elongatis; calyce pilosulo, subcampanulato, dentibus 5, inæqualibus, obtusiusculis; corolla tubulosa, pilosa, coccinea? calyce 6-plo longiore, limbo brevi, subcampanulato, margine ciliato dentibus 5 et alteris in sinubus fere obsoletis, donato staminibus inclusis, filamentis filiformibus, glabris, imo incrassatis et tomentosis.—Columbia. *v. s. in herb. Hook.* (*Hartweg*, 1310.)

To the details before given (huj. op. p. 18), I have now only to observe that the border of the corolla is very short, with teeth somewhat larger than in I. *tubulosa*; the filaments are inserted a little above the middle of the tube, thickened at base, and densely tomentose for one third of their length, more slender and glabrous above, and shorter than the corolla.

5. Iochroma *gesnerioides*. Chænesthes gesnerioides, *Nob.* (*loc.* cit. p. 19.) Lycium gesnerioides, *H.B.K.* vol. iii. p. 53: ramulis cano-tomentosis, foliis ovatis, oblongisve, acutis, superne demum fere glabris, infra pulverulentis; floribus umbellato-fasciculatis; calyce 5-dentato; corolla tubulosa, aurantiaca, limbo subbrevi,

campanulato, sinuato-5-lobo, angulis acutis, filamentis imo tomentosis, antheris subexsertis.—Peruvia. *v. s. in herb. Hook.* (*Prov. Chachapoyas, Mathews.*)

It may be observed in addition to what was formerly remarked upon this species, that the pentangular border of the corolla is more distinctly cleft than in any other species, and exhibits a tendency of form towards that of *Cleochroma*: the berry is equal in size to that of the species just mentioned, and is almost enclosed by a persistent calyx of very similar form, sometimes cleft irregularly.

6. Iochroma *Loxensis*. Chænesthes Loxensis, *Nob.* (*loc. cit.* p. 18.) Lycium Loxense, H.B.K. — Loxa, regni Ecuadorensis.

7. Iochroma *cornifolia*. Chænesthes cornifolia, *Nob.* (*loc. cit.* p. 19.) Lycium cornifolium, H.B.K.—Quito.

8. Iochroma *lanceolata*. Chænesthes lanceolata, *Nob.* (*loc. cit.* p. 19.): fruticosa, ramulis subferrugineo-floccosis: foliis lanceolatis vel oblongis, valde acuminatis, supra parce pubescentibus, infra pallidioribus, floccoso-tomentosis, petiolo caniculato tomentoso; floribus plurimis, umbellato-fasciculatis, calyce tubuloso, subinflato, dentibus 5, inæqualibus, obtusiusculis; corolla tubulosa, flavescente, calyce 4-plo longiore, limbo brevissimo 5-dentato. —Ecuador. *v. s. in herb. Hook.* Quindiu (*Goudot*), idem (*Purdie*). —Columbia (*Seemann*).

Respecting this species, in addition to my former remarks (*loc. cit.*), it may only be observed, that the corolla in shape and size, also resembles that of *Iochroma tubulosa*, and were it not for the colour of its flowers, which are said to be of a pale yellow, some of the specimens might almost be mistaken for that species. The berry, nearly altogether enclosed by the enlarged calyx, which splits on one side, also resembles that of the plant just mentioned. In some cases, the leaves are less lanceolate than in the specimen which I first saw and formerly referred to; they are sometimes much acuminated at each extremity, six inches long, and three inches broad, upon a petiole one inch in length.*

* A figure of this species will be given in Plate 31.

CLEOCHROMA.

The plant with long, dark, purple flowers which I described under the name of Iochroma *macrocalyx*, Hook. (*ante p.* 19.), was, without hesitation, referred to that genus, on account of its being evidently congeneric with the *Iochroma calycina*, Bth. Since then, as I have just mentioned p. 141, I have had an opportunity of examining the typical species *Iochroma tubulosa*, Bth., which I had not seen at the period referred to, and have indicated the reasons for associating *Chænesthes* with that genus; but at the same time it appears to me, that not only *I. macrocalyx*, but also *I. calycina*, Bth., and *I. grandiflora*, Bth., should be detached from it, and retained as a separate group, for which I propose the name of *Cleocroma*, from κλεος, *præstantia*, χρωμα, *color*, on account of their large, handsome, purple flowers. The differences between it and *Iochroma*, which I will now proceed to point out, appear sufficient to warrant its assuming the rank of a distinct genus, but should it be thought otherwise, it may take its station as a third section of *Iochroma*: the differences between them are certainly much greater than those which separate *Physalis* and *Saracha*. In *Cleochroma* the calyx is generally very large, much more so in proportion than in *Iochroma*, increasing even during the development of the flower, becoming sometimes nearly half the length of its long, tubular corolla, and swelling in the middle to a much larger diameter: it is in like manner persistent, and at length wholly encloses a berry of considerable size. The corolla is, in like manner, quite tubular, and also somewhat swollen in the middle, but the border is very considerably larger, more expanded, and deeply divided into five distinct segments, while in *Iochroma*, the border is very narrow, but little expanded, and almost entire. The contrast between the corolla of all the species of *Iochroma* and that of *Cleochroma grandiflora*, with its large azure-blue flowers, with the mouth broadly expanded into a campanular form, and deeply cleft into five acute lobes, is very remarkable. In *Iochroma* (including *Chænesthes*), the filaments of the stamens are always more or less terete, and thickened towards the base, this

lower portion being always densely tomentose, while the upper half is glabrous: in *Cleochroma*, on the contrary, the filaments are very thin, dilated, and membranaceous, especially the lower moiety, which is quite glabrous, or only sometimes slightly pubescent on the margins: their insertion is near the base in *Iochroma*, while in *Cleochroma*, although adnate below, they become free only a little below the middle of the tube of the corolla, which is pubescent thence to the base, while the filaments remain more or less glabrous. Even in the dried specimen, the remains of the thin annular disc surrounding the base of the ovarium may be seen in *Iochroma*, but I have not been able to distinguish it in that of *Cleochroma*. In *Cleochroma* the berry is larger, the seeds being apparently imbedded in a greater quantity of pulp, the embryo is less curved, and the cotyledons much shorter in proportion, forming even less than one third of its whole length, while in *Iochroma*, they are equal in length to the radicle. In the seeds of *Iochroma* and *Chænesthes*, the hilum is seen laterally in the sinus of the margin, where it is scarcely distinguishable by any particular mark, but in *Cleochroma macrocalyx*, I have noticed, in every instance, that the hilum is distinctly perforated through the testa, which is of thinner texture than in the seeds of *Iochroma*.

Cleochroma, gen. nov.—*Calyx* tubulosus, medio ventricosus, ore subconstrictus, inæqualiter 5-dentatus, reticulatus, persistens, et sæpius augescens. *Corolla* tubulosa, tubo medio subdilatato, calyce 2-plo, rarius 6-plo longiore, limbo conspicuo, campanulato, 5-partito, lobis acutis, æstivatione plicata. *Stamina* 5, inclusa; *filamenta* dilatata, tenuia, glabra, corollæ tubo imo adnata, infra medium libera; *antheræ* oblongæ, 2-loculares, loculis parallelis, connectivo dorsali adnatis, basi paulo cordatis, in sinu affixis, longitudinaliter dehiscentibus. *Ovarium* obovatum, 2-loculare, ovulis plurimis in dissepimento incrassato utrinque affixis. *Stylus* filiformis, apice incrassatus. *Stigma* capitato-bilobum. *Bacca* magna, ovata, calyce inflata inclusa, 2-locularis. *Semina* numerosa, compressa, reniformi-rhomboidea, in pulpam copiosam nidulantia, testa scrobiculata, hilo in sinu laterali perforato. *Embryo* intra albumen carnosum fere semiannularis, filiformis, cotyledo-

nibus semiteretibus, radicula incurvata, infera, ab hilo declinante, duplo, 3-plove brevioribus.—Suffrutices *Ecuadorenses*, folia *alterna petiolata*, flores *speciosi*, *purpurascentes*, *sub-umbellati*, pedicellis *elongatis*, *unifloris*.

1. Cleochroma *macrocalyx*. Iochroma macrocalyx, *Hook.* (*ante* p. 19:) *Lond. J. Bot.* iv. p. 339, tab. 13–14: foliis rhomboideo-ovatis, utrinque molliter pubescentibus, subtus pallidis: floribus umbellato-fasciculatis: calyce tubo magno, ventricoso, 5-dentato, dentibus inæqualibus, corolla magna, speciosa, tubo calyce 2–3-plo longiore, hirtella, violacea, staminibus inclusis, filamentis dilatatis, glabris, nervo longitudinali notatis, imo margine ciliatis.—Quito, in vallem Lloæ altit. 9,500 ped. *v. s. in herb. Hook.* (*Hall.*)

I have little to add to the details of this species given in the place above quoted, except that of the observations made by Col. Hall, that "the calyx and corolla are of a deep indigo blue."

2. Cleochroma *calycina*. Iochroma calycina, *Bth. Bot. Reg.* 1831. *sub Tab.* 20: ramulis angulatis, verrucosis, pallide floccoso-pulverulentis; foliis deflexis, oblongo-lanceolatis, minute ruguloso-punctatis, aspero et incano-pulverulentis, inferne flavidis et araneoso-pulverulentis, petiolo valido, caniculato, imo crassiore; floribus fasciculato-congestis, calyce magno, medio inflato, demum augescente, hinc fisso; corolla tubulosa, cyanea, floccoso-pubescente, limbo expanso, 5-partito, genitalibus inclusis, filamentis dilatatis, tenuibus, nervo centrali notatis, glabris, imo margine ciliatis.—Columbia. *v. s. in herb. Hook.* (Hartweg. *n.* 1312.)

This plant has a very peculiar appearance; the leaves are turned down by the deflexion of the petiole, and are remarkable for the numerous close, almost scabrid spots of pulverulent hairs, and for the yellowish glandular pruinose down, that covers the under surface: they are six inches long, and two inches and a quarter broad, on a petiole of three quarters of an inch: the pedicels are one inch long, swelling upwards, the calyx, at first small and cylindrical, afterwards swells and acquires, before the ripening of the fruit, a length of one inch and a half, and is dilated below to the diameter of half an inch, remaining contracted in the mouth, so that by the growth of the included berry, it becomes ruptured on

one side towards the summit: the tube of the corolla is more slender than the former species, and is one inch and a half long.

3. Cleochroma *grandiflora*. Iochroma grandiflora, *Bth.* (*loc. cit.*): fruticosa, ramulis angulato-compressis, striatis, junioribus floccoso-tomentosis; foliis late ovatis, basi rotundatis, ad petiolum tenuem breviter et abrupte attenuatis, apice acuminatis, supra pulverulento- tomentosis, subtus pallidioribus et molliter pubescentibus, penninerviis, nervis divaricatis; floribus apice ramulorum fasciculatis, pendulis, pedunculis elongatis calyceque brevi demum ampliato molliter pubescentibus, corollæ infundibuliformis tubo longo, pubescente, fauce sub-campanulato, limbo 5-lobo, lobis amplis, triangularibus, staminibus imo ortis, fere inclusis, filamentis omnino glaberrimis.—In Andibus Peruvianis regno Ecuadorensi conterminis. *v. s. in herb. Lindley.* (Lobb. n. 316.) *in herb. Hook.* (Hartweg. 814.)

This plant is quite distinct from any of the other species; the leaves have ten or twelve pairs of nerves, diverging nearly at right angles with the mid-rib: they are three inches and a half long, two inches broad, with a caniculate petiole ten lines in length; the umbels, arising with a few leaves from the summit of the young branchlets, which are scarcely longer than an inch, are from six to eight flowered: the flowers are pendulous from a somewhat slender peduncle, twenty-two lines long; the calyx in its florescent state, is only four lines long, and three lines in diameter, but it increases considerably in size with the fruit: the tube of the corolla, which is cylindrical, is one inch to one inch and a half long, and one line and three quarters in diameter, spreads suddenly into a somewhat campanulate border, one inch to one inch and a half in diameter, and is divided into five, oblong, acute, somewhat expanded lobes; it is described as being of an "azure blue" colour.* The tube is quite glabrous, even at the base, where, in the other two species, it is somewhat pubescent.

* This plant, with sectional details, is represented in Plate 32.

HEBECLADUS.

To this genus, which I proposed on a former occasion (*ante* p. 1), I have to add the following new species.

9. Hebecladus *mollis*, (n. sp.): caule subherbaceo, flexuoso, dichotomo, hirtello, subangulari: foliis geminatis oblongis, basi obtusatis, apice acuminatis, irregulariter et grosse sinuato-serratis, utrinque molliter hirtellis, pilis articulatis, pedunculo axillari, vel e dichotomia orto, gracili, molliter piloso, 2-floro, folio subæquilongo, corolla glabra, lutea, genitalibus inclusis.—Nova Grenada—*v. s. in herb. Hook.* (Goudot, *Plages de Combayma.*)

This plant has very much the habit of H. *asperus*, but the leaves are deeply sinuate, almost lobed, and covered with long, soft, articulated hairs. The leaves are two inches long, one inch and a quarter broad, with a petiole half an inch in length; the peduncle measures one inch and a quarter, the pedicels half an inch, the calyx a quarter of an inch, the corolla three quarters of an inch, with a campanulate pentangular border.*

10. Hebecladus *granulosus*, (n. sp.): caule suffruticoso, flexuoso, dichotomo, angulato, fusco-tomentello: foliis solitariis, ovatis, attenuatis, supra furfurosis, vel glanduloso-asperulis, junioribus hirtellis, pilis articulatis, subtus pilosulis: pedunculis solitariis, e dichotomiis axillaribus, pilosis, petiolo æquilongis, 2-floris, floribus pedicellatis, calyce parvulo, molliter piloso, corolla lutea glabra, margine tomentello, genitalibus inclusis.—Nova Grenada. *v. s. in herb. Hook.* (Goudot, *locis frigidis inter Ibague et Cartago*).

This species approaches H. *lanceolatus*, but the leaves are smaller, and broader in proportion to their length; they are two inches long, one inch broad, on a petiole three-eighths of an inch in length: the peduncle is scarcely one line long, the pedicels, very tomentose, are four lines; the calyx two lines; the corolla almost glabrous, tubular below, campanular above, is five lines long, exclusive of its spreading border of five triangular segments with tomentose margins, two lines long.

11. Hebecladus *sinuosus*, (n. sp.): caule angulato, striato,

* A representation of this species, with details, will be seen in Plate 33.

molliter piloso; foliis alternis, vel geminatis, altero subminori, oblongis, grosse sinuato-dentatis, lobis obtusiusculis, utrinque pilis articulatis molliter hirsutis, margine ciliatis, rachi nervisque prominulis, imo in petiolum elongatum anguste decurrentibus; pedunculo bifloro, petiolo 3-plo breviore, pedicellis æquilongis, calyceque dense pilosis, corolla fere glabra, sicco lutea, limbi lobis acutis, staminibus vix exsertis.—Peruvia, Prov. Chachapoyas. *v. s. in herb. meo* (Mathews).

This species corresponds much in habit with the figure of *H. biflorus* (*Atropa biflora*) of the Flora Peruviana, but it is altogether covered with soft articulated down, and the leaves are larger, more sinuosely lobed, and with a much longer petiole. The leaves are four inches and a quarter long, by two inches and a half wide, the petiole being one inch and a half long; the peduncle measures only four lines, the pedicels are of the same length, the calyx three lines, and the corolla, tubular below, five-nerved, smooth, with a five-lobed expanded border, altogether six lines long. It differs from *H. mollis*, in having much smaller leaves, in being less hirsute, with an infinitely shorter inflorescence.

PŒCILOCHROMA.

I propose to distinguish under this name a very distinct group of Solanaceous plants, all natives of the Vallies of the Andes of intertropical America. The type is the *Saracha punctata* of the Flora Peruviana. They are distinguished from that genus in being frutescent shrubs or trees, not herbaceous plants, in their leaves being generally thick, fleshy, shining, and more or less destitute of pubescence, and their much larger corolla, not rotate, but decidedly campanulate, of much thicker consistence, often fleshy, and generally marked with beautiful spots, whence the derivation of its name, from ποικιλος, *variegatus*, χρωμα, *color*. It is distinguished from *Hebecladus* and *Iochroma*, by its much smaller, glabrous, fleshy leaves, by its campanulate corolla, with an expanded pentangular border, not tubular and five-lobed, as in those genera: from *Cleochroma* it differs in the form of its corolla, and in its calyx not becoming considerably enlarged with the

fruit. From *Lycioplesium*, to which in many of its species it approaches greatly in habit, and in the peculiar appearance of its leaves, it differs by its being destitute of spines, by its larger, broader, and more campanulate corolla.

Pœcilochroma: gen. nov. — *Calyx* turbinatus, ore valde coarctatus et in dentibus 5 brevissimis approximatis desinens, tubo subcoriaceo, colorato, inæqualiter in fissuras 1–2–3 abrumpens, persistens et non augescens. *Corolla* speciosa, campanulata, imo in tubum brevem contracta, plus minusve crassiuscula, sæpissime ornatim maculata, limbo expanso, sinuato-5-lobo, æstivatione plicato. *Stamina* 5, imo corollæ inserta, inclusa: *filamenta* tenuia, erecta, colorata: *antheræ* oblongæ, 2-lobæ, lobis parallele adnatis, intus longitudinaliter dehiscentibus. *Ovarium* obovatum, 2-loculare. *Stylus* longitudine staminum, gracilis. *Stigma* clavato-bilobum. *Bacca* pisiformis, calyce suffulta, 2-locularis. Semina plurima, cætera ignota.

Frutices *Ecuadorenses et Peruviani glabri*: folia *integerrima oblonga vel spathulato-ovata, breviter petiolata, crassiuscula, venis immersis*: flores *axillares, solitarii, vel bini, interdum plurimi, pedunculis* 1-*floris elongatis, apice incrassatis, coloratis*: corolla *aurantiaca, pulcherrime maculata, vel rubicunda*: baccæ *pisiformes, rubræ.*

1. Pœcilochroma *punctata*. *Saracha punctata*, R. & P. (Fl. Peruv. vol. ii. p. 42. tab 178 *b*:) suffruticosa: ramulis teretibus, fusco-coloratis, glabris, junioribus pulverulentis: foliis solitariis, rarius geminis, ovato-oblongis, venosissimis, supra glabris, subtus pulverulentis: floribus ad summum ramorum fasciculatim aggregatis, nutantibus, pedunculis 6–7, elongatis, unifloris, apice incrassatis; calyce in dentibus rotundatis rumpente; corolla magna, late campanulata, limbo sinuato-5-angulato, extus pulverulenta, intus luteo-purpurascente, punctis purpureis maculata: genitalibus inclusis, glabris.—Ad Muna, Tambo, Portachuelo, et Obrajilla, in Andibus Peruvianis.

The above plant, referred by Ruiz and Pavon to *Saracha*, unquestionably differs from all other species of that genus, which are generally herbaceous, straggling plants, and very pubescent,

with a smaller and very rotate corolla of much thinner texture. The leaves from the figure above quoted, are two inches and a quarter long, one inch and five-eighths broad, with a petiole about three lines in length; the peduncle is about one inch and a quarter long: the corolla is one inch in length, and one inch and a half broad across the margin.

2. Pœcilochroma *frondosa* (n. sp.): suffruticosa, ramulis subcompressis, angulato-striatis, angulis ex axillis decurrentibus, rugulosis, glabris, valde foliosis: foliis subfasciculatis, ellipticis, utrinque attenuatis, subtenuibus, supra glabris, subtus parce fulvo-tomentosis, penninerviis, rachi nervisque subtus rubescentibus, margine revolutis: floribus ex apice turiorum juniorum fasciculato-aggregatis, fasciculis foliosis, pedunculo uniflore, glabro, apice incrassato, longitudine floris nutantis; calycis colorati dentibus 5 brevibus rotundatis; corolla speciosa, campanulata, extus fulvo-pulverulenta.—Prov. Chachapoyas Peruviæ. *v. s. in herb. meo* (Mathews).

Although intermediate with the foregoing and following species, it is manifestly distinct from both. Its leaves are three inches and a quarter long by one inch and a quarter broad, with a petiole three quarters of an inch long. About six or eight flowers are closely aggregated on the very short, young branchlets, and are mixed with young leaves: the peduncles are nine lines long, and are much thickened at the apex: the calyx is short, tubular, smooth, and with the peduncle, is of a dark, red colour, its margin being membranaceous, and unequally split into five, short, rounded teeth. The corolla is one inch long, and nine or ten lines in diameter on the ciliate margin, which is sinuately five-angular, very slightly pulverulent, and nearly glabrous outside; almost smooth within the mouth, but pubescent in the lower and more contracted portion: the filaments are slightly pubescent, with long, spreading, articulate hairs, are somewhat unequal in length, scarcely more than half the length of the corolla, and are slightly dilated at base. The ovarium and style are glabrous, the latter being the length of the stamens: the stigma is clavately bilobed.

3. Pœcilochroma *guttata* (n. sp.): suffruticosa, ramulis anguloso-striatis, subverruculosis, omnino glabris: foliis solitariis, rarius geminis, obovatis, apice breviter et repente attenuatis, imo subcuneatis, crasso-coriaceis, utrinque (etiam junioribus) glaberrimis, et eveniis, supra lucido-viridibus; subtus luteo-pallidis, margine revolutis, breviter petiolatis: floribus 8–9 ad apicem ramorum fasciculato-aggregatis, nutantibus, pedunculis unifloris, apice incrassatis, flore paulo longioribus, calyce glabro, corolla speciosa, campanulata, limbo sinuato-5-angulato, extus pulverulento-tomentosa, intus subglabra, punctis purpureis maculata, et imo pubescente, ovario tomentoso.—Peruvia. *v. s. in herb. meo.* (Mathews, *No.* 1151. *sub nomine Saracha punctata*, R. & P.)

Judging from the details and figure in the Flora Peruviana, this plant is certainly specifically distinct from the first described species to which Mathews referred it. The spots in the corolla are not distinguishable in the dried state, and they are probably more or less common to all the species of this genus: its leaves are small, fleshy, with a total absence of all pubescence, and of any apparent venation, are more ovate, much smaller, with a comparatively longer petiole than in *P. punctata*; in fact, they more resemble those of the genus *Lycioplesium*: in the specimen I possess, they measure one inch and five-eighths in length, and seven-eighths of an inch in breadth, with a petiole one inch and a quarter long; they are thick, fleshy, polished above, below of a pale greenish colour, with a prominent reddish mid-rib, and about five pairs of spreading, slightly prominent nerves. The pedunclles are nearly one inch long, and nodding, being much thickened towards the apex: the corolla is of the same length, and seven-eighths of an inch in diameter across the mouth; it is less campanulate below, and the lobes of its border more acute, with a rounder intervening sinus than in *P. punctatus*; the margin is ciliately tomentose, outside it is covered with short, yellowish tomentum, inside it is nearly smooth, except towards the base, where it is very pubescent; the calyx is quite glabrous, with roundish, unequal, and membranaceous lobes, five longitudinal nerves, one in the middle of each lobe, terminating in as many

short tomentose mucronate teeth. The ovarium is obovate and tomentose; the style and stigma are quite glabrous, and together with the stamens, are about three-fourths the length of the corolla; the stigma is clavately bilobed.

4. Pœcilochroma *maculata* (n. sp.) : fruticosa, ramulis junioribus floccoso-tomentosis, adultis glabris, cortice rimoso-verruculoso : foliis alternis, vel geminis, oblongis, basi cuneatis, breviter petiolatis, crassiusculis, margine revolutis, supra lucidis, nervis pinnatis impressis, tomentellis, subtus fulvo-tomentosis; floribus axillaribus, solitariis, vel geminis, aut ad apicem ramulorum novellorum fasciculatim-aggregatis : pedunculis elongatis, calyceque brevi 5-dentato glabris : corolla speciosa, imo breviter tubulosa, cito late campanulata, flava, maculata, utrinque pulverulento-pubescente, limbo sinuato, 5-angulato, genitalibus inclusis, glabris; bacca globosa, pisiformi, calyce persistente suffulta. — In Andibus Peruviæ. *v. s. in herb. Lindley.* (*Lobb n.* 152 *et* 388.)

This is a very handsome species. The leaves are two inches long, one inch and an eighth broad, with a petiole four lines in length; the peduncle, which is considerably thickened at the apex, is one inch long, and drooping; the corolla is large and handsome, being one inch and a quarter in length, and the same in diameter across the border; it is described as being "yellow spotted." The berry is small, about the size of a pea, and supported on the persistent calyx, which does not increase in size.

5. Pœcilochroma *Lobbiana* (n. sp.) : suffruticosa, ramis junioribus cupreo-floccosis, adultis nigrescentibus, ramulis divaricatis : foliis ellipticis, utrinque acutis, apice sæpe obtusis, margine revolutis, utrinque glaberrimis, supra nitidis, nervis pinnatis impressis, subtus pallide virescentibus, rachi prominente rubello, petiolo brevi, glabro, tenui, caniculato; floribus speciosis, axillaribus, binis, rarius ternis, pedunculo apice incrassato folii longitudine, calyceque brevi 5-dentato glabris : corolla imo coarctata, deinde campanulata, sicco aurantiaca, extus pubescente, intus glabra, et versus basin leviter pubescente, limbo sinuato, 5-angulato : genitalibus inclusis glabris.—In Andibus Peruviæ. *v. s. in herb. Lindley.* (*Lobb. n.* 389.)

This species, in the appearance of its leaves, has very much the habit of the genus *Lycioplesium*, but the flowers are much larger, and more showy. The leaves are one inch and a half long, ten lines broad, with a petiole three lines in length: the peduncle is one inch and a quarter long, drooping, slender at base, thickened at its summit; the calyx is two lines long, three lines broad, somewhat pentangular, and five-nerved, the teeth being short, and rounded, with a mucronate apex: the corolla is large and handsome, one inch and an eighth in length, and one inch and a quarter in diameter across the border: the stamens are glabrous, three quarters the length of the corolla, the style is somewhat longer, glabrous, slender, and the stigma clavately bilobed *.

6. Pœcilochroma *Lindeniana* (nov. sp.): suffruticosa, ramis rugosis, striatis, glabris: foliis cuneato-oblongis, in petiolum brevem attenuatis, apice obtusis, sub-emarginatis, margine revolutis, utrinque glaberrimis, crassis, supra nitidis, nervis impressis eveniis, subtus luteo-pallescentibus, rachi nervisque prominentibus; floribus axillaribus solitariis nutantibus, pedunculo folio florifero longiore, apice incrassato, corolla speciosa, campanulata, aurantiaca, extus pulverulenta, margine floccoso 5-angulato: genitalibus vix inclusis.—Ecuador.—*v. s. in herb. Hooker.* (*Linden, n.* 489.)

It possesses a habit very similar to the species before described, its leaves are one inch and an eighth long, five-eighths of an inch wide, tapering, with a very short petiole two lines in length: the axils are approximate, scarcely more than nine lines apart. The peduncle is nine lines long, the dark-red fleshy calyx splitting irregularly into three unequal triangular mucronate lobes with membranaceous edges, is three-eighths of an inch long, the corolla is large, broadly campanulate, one inch and a quarter long, one inch in diameter in the mouth, the somewhat expanded, pentangular border, measuring one inch and a half in diameter.

7. Pœcilochroma *Quitensis*. Lycium Quitense, *Hook. Icon.* 723: fruticosa, glabra; foliis ellipticis, obovatisve, obtusis, subcoriaceis, margine revolutis, breviter petiolatis, utrinque glaberrimis, supra

* The above plant is represented in Plate 34.

lucidis, subtus flavo-pallescentibus; floribus axillaribus, binis, nutantibus, pedunculo folio fere æquilongo, calyce imo coarctato, brevissime 5-dentato, cito irregulariter 2–3-fisso, corolla glabra, infundibuliformi-campanulata, limbo patente, sub-5-lobo : genitalibus corollæ æquilongis, glabris.—In Andibus Quitensibus—*v. s. in herb. Hooker.* (*Jameson, n.* 200.)

The drawing above quoted gives an excellent representation of this species. I observe, however, that when the corolla is fully grown, it is more campanulate, and the border is more pentangular than is there figured, where it is seen in its half plicated state before full expansion; in that state the plicatures of the sinus bear somewhat the appearance of intermediate teeth, but these in reality do not exist. The leaves are of a bright, shining green, one inch and three quarters long, three quarters of an inch broad, with a fleshy channelled petiole of two lines in length: above, the nervures are wholly immersed in the fleshy parenchyma; below, they are seen much spreading, and with the prominent midrib of a reddish colour. The peduncles, nearly as long as the leaves, are nodding, and are considerably thickened above: the calyx is fleshy, three lines long, with five short, obtuse, mucronate teeth, and its membranous margin is often split irregularly nearly to the base: the corolla appears of a dark orange or crimson hue, rather thick in its texture, smooth below, but slightly pubescent above outside: within the mouth it is smooth, but below it is pubescent: it is three quarters of an inch long, and measures three quarters of an inch across the mouth when fully expanded. The whole plant, especially in the shape and texture of the leaves, as well as in the appearance of the flowers, approaches very closely some species of the genus *Lycioplesium*; but it is not spinose, and the structure of the calyx and corolla determines its place.

APPENDIX.

APPENDIX.

Observations upon several genera hitherto placed in Solanaceæ, *and upon others intermediate between that family and the* Scrophulariaceæ.

My attention during the last few years having been directed to the study of the *Solanaceæ*, I have given the results of this inquiry in a series of memoirs in the 'Lond. Journ. Bot.,' vols. iv., v. and vii., which are reprinted in this work, where delineations are offered of the peculiar features of each genus. Having at length completed the analysis of the remaining genera of this order, the results will be given in a succeeding volume; but in order to explain my views in regard to that family, the following observations are necessary.

Following the track I had marked out as the basis of these investigations, which has been chiefly to satisfy myself by careful analysis of the true limits that serve to separate different genera, I have encountered a number of facts which are very difficult to reconcile with our present distribution of the *Solanaceæ*, and which have induced me to carry this inquiry much further than was at first contemplated. These results having been published at intervals, as they presented themselves, the order in which they have appeared is necessarily imperfect in a systematic point of view; but as my principal object has been to arrive at truth, I expect some degree of indulgence, for what may appear as defects of arrangement and want of plan. I have alluded to the increasing number of novel cases that have offered themselves during this inquiry, which render it difficult to decide whether certain genera should be classed in *Solanaceæ* or in *Scrophulariaceæ*, as these natural orders are at present considered; and in consequence of the accumulation of these anomalies, it appears at length necessarily expedient to draw a more certain line of distinction between these two important natural orders. This difficulty is not new in the history of the science, for nearly forty

years ago it did not escape the acute penetration of our distinguished countryman Mr. Robert Brown, who then suggested the plan of avoiding it by the establishment of an intermediate family*. Another of the great botanists of our time, Mr. Bentham, who has made the *Scrophulariaceæ* one of the chief objects of his study, and to whom we are indebted for the admirable monograph of that order in the 10th volume of the 'Prodromus' of DeCandolle, published only two years ago, although evidently aware of this necessity, has never carried it into execution: the tribe of the *Salpiglossideæ*, which he placed at the head of the *Scrophulariaceæ*, was manifestly framed under a point of view bearing toward this end; and in the addenda to the same volume of the 'Prodromus,' p. 595, he offers some remarks upon what I had previously hinted, respecting the separation of the genus *Lycium* from the *Solanaceæ* (*huj. op.* p. 107).

The establishment of the *Salpiglossideæ* in the manner just mentioned, has however in no degree removed the objections before existing, and from the facts which I shall now have to communicate, these exceptions will be seen increased to a manifold amount, for it is now evident that a considerable number of genera, hitherto placed in *Solanaceæ*, possess a regular corolla, with a 5-lobed border, offering an imbricate æstivation, contrary to the usual structure of the order, and although possessing five stamens, one is often smaller, and sometimes sterile, showing an evident tendency towards the structure of the *Scrophulariaceæ*; and thus, besides *Lycium* and some of the genera of the *Salpiglossideæ*, we have now *Petunia*, *Nierembergia*, *Solandra*, *Juanulloa*, *Marckea*, *Hyoscyamus*, *Atropa*, *Mandragora*, *Nicandra*, *Anisodus*, &c. &c., forming too important a number of exceptional cases to be passed over in neglect. Having lately examined with much care the structure of most of these genera, I am now better prepared to carry out the views, which I hinted at three years ago, in an earlier stage of this inquiry (*huj. op.* p. 76), where I suggested the propriety of associating these dissident genera in a distinct and intermediate tribe or family.

I therefore now propose definitely to confine the *Solanaceæ* as

* *Solanaceæ*, "a Scrophularinis distinguuntur præcipue embryone arcuato vel spirali et corollæ æstivatione plicata, floribusque sæpissime regularibus isostemonibus. Hinc genera corolla non plicata et simul embryone recto, vel excludenda, vel cum iis corolla imbricata, embryone leviter arcuato, staminibusque didynamis in propria sectione disponenda, futuri ordinis initia."—*Prodr.* p. 444.

From the state of our knowledge at that time, it is evident that these allusions were intended to apply principally to the *Verbasceæ*, which by Jussieu, Linnæus and most preceding botanists were classed among *Solaneæ*, but they certainly may be referred with additional force to the instances alluded to above.

nearly as possible within the limits prescribed by Mr. Robert Brown in his 'Prod.' (*loc. cit.*), viz. to those genera with a monopetalous corolla, with a 5-, rarely 4-partite border, even in exceptional cases nearly regular and equal, the borders of whose lobes are always valvate or induplicato-valvate in æstivation; epipetalous stamens, alternate with and equal to the number of the lobes, the fifth being seldom shorter and still more rarely sterile, anthers always bursting by longitudinal slits or pores; an ovarium most generally 2-celled, rarely 3- to 5-locular, with a simple style, a bilobed or clavate stigma often hollow; a fruit either capsular or baccate, and albuminous seeds with a terete embryo, straight, and more or less curved in a nearly annular form, or somewhat spiral, the radicle in all cases pointing to the basal angle of the seed, and turned away to some short distance from the hilum, which is generally lateral and marginal, rarely almost basal.

The *Scrophulariaceæ* I would also propose should be confined to those genera that possess a tubular corolla more or less curved and irregular, with a 4- or 5-partite border generally unequal and bilabiate, the lobes rarely equal, but in every case with a decidedly imbricate æstivation; stamens 2 or 4, didynamous, seldom with a fifth, which is very rarely fertile, often only rudimentary: an ovarium, most generally bilocular; a simple style, with a stigma more or less bilabiate or bilobed; the fruit almost always capsular (in very few instances baccate), 2-locular, rarely more-celled, bursting in various ways, with central placentæ adnate to the dissepiment, and an embryo enveloped in albumen but little curved, generally with the radicle pointing to a basal hilum*; in one solitary instance (*Campylanthus*) the embryo is however perispherically curved. In this very natural family, although the floral leaves are often alternate, the cauline leaves are most generally opposite, which occurs only accidentally in *Solanaceæ*, and the origin of the inflorescence is strictly axillary. Thus limited, they form a very distinct natural order.

The intermediate group, which I now propose as a suborder, under the name of *Atropineæ*, or as a new order, under that of *Atropaceæ*, will consist of genera having a tubular persistent calyx, more or less deeply divided, a hypogynous tubular corolla, with the tube more or less plicated in bud, and with a border generally divided into 5 lobes slightly unequal, but which are

* According to Mr. Bentham's authority, DeCand. 'Prod.' x. p. 186, and a statement positively affirmed by most botanists, but one which, it appears to me, must be received with some modification; for in the seemingly truthful analyses of the genera figured by Nees v. Esenbeck, 'Gen. Pl. Germ.,' the radicle is shown as in *Solanaceæ*, not pointing directly to the hilum. See plates of *Erinus*, *Veronica*, *Wulfenia*, *Odontites*, *Euphrasia*, *Bartsia*, *Pedicularis*, and *Alectorolophus* (*Rhinanthus*).

always either imbricately disposed in æstivation or arranged under some modification between that form and the plicate, but never valvate, the margins of each lobe being constantly free from those of the adjoining ones; they have generally 5 fertile epipetalous stamens, alternate with the lobes, with one of them sometimes a little shorter, 1 or 3 being very rarely sterile; anthers bilobed, with the lobes parallel, bursting longitudinally at the margin, one of these lobes being sometimes sterile; the ovarium 2-celled, rarely 5-locular, with ovules generally ascending, attached to fleshy placentæ which are adnate to the dissepiments, as in *Solanaceæ* and *Scrophulariaceæ*, a simple style, and a bilobed stigma often of a very peculiar form; the fruit is either baccate or capsular, the seeds generally reniform or compressed, with a lateral hilum; the embryo, placed in albumen, is either straight or more or less curved, sometimes perispherically or spirally. They are plants with much the habit of the *Solanaceæ*, with alternate, simple or geminate leaves, many of them possessed of powerfully medicinal properties.

They offer the peculiarity, distinct from *Scrophulariaceæ*, and similar to that of the *Solanaceæ*, in having the origin of the inflorescence always somewhat extra-axillary and lateral in regard to the insertion of the petiole. I propose to arrange them in the following manner :—

Atropineæ or Atropaceæ.

Tribe 1. *Nicotianeæ*. Corolla with an elongated funnel-shaped tube, often more or less hypocrateriform, with 5 nearly equal lobes, which are conduplicate and then twisted in æstivation, as in *Convolvulus* : stamens 5, one frequently shorter; anthers 2-lobed, lobes almost free, medifixed, and without connective, bursting laterally along the outer edge: capsule 2-locular with bifid valves, the margins of which are somewhat septicidal, and slightly inflexed at base : seeds with a short terete embryo somewhat incurved or slightly arcuate. — *Nicotiana*, *Lehmannia*, *Sairanthus*, *Polyclidia*.

Tribe 2. *Datureæ*. Corolla with an elongated funnel-shaped tube, having a 5-angular expanded border with a contorted complicated æstivation, as in the *Nicotianeæ* : 5 equal stamens; anthers 2-lobed, lobes linear, laterally adnate, dorsally attached to a fleshy connective, and bursting longitudinally in front : fruit sub-baccate or capsular, 2-celled above, 4-celled below, with the fleshy placentæ adnate to the middle of the dissepiment : seeds with a nearly annular curved terete embryo. — *Datura*, *Ceratocaulis*, *Brugmansia*.

Tribe 3. *Duboisieæ*. Corolla with a tube either elongated and ventricose above, or short and rotate, with a 5-lobed border, the lobes being diversely volutive in æstivation: 5 equal stamens or 4 didynamous with the rudiment of a fifth; anthers rounded, cordate, always extrorse, either 2-celled, with the cells confluent at the apex, or unilocular with a hippocrepiform line of dehiscence, and gaping transversely as in *Verbascum*: ovarium 2-locular, with numerous ovules affixed to thickened placentæ adnate to the dissepiment: fruit either baccate or capsular, 2-valved, with septicidal dehiscence: terete embryo in albumen, slightly curved.

Duboisia, *Anthocercis*, *Anthotroche*.

Tribe 4. *Schizantheæ*. Corolla deeply cleft into several irregular divisions, with a somewhat reciprocative æstivation: stamens 5, of which 3 are sterile; style erect, with a small fistulose stigma, slightly swollen below, its contracted entire margin filled with a globose viscous gland: capsule 2-celled, 4-valved, seeds with a terete hemicyclically arcuate embryo.

Schizanthus.

Tribe 5. *Salpiglossideæ*. Corolla more or less ventricose above, sometimes contracted in the mouth, the border being divided into 5 nearly equal regular segments, one of them always somewhat larger and more erect, their æstivation being reciprocative (see p. 172): stamens 4, didynamous, sometimes with the rudiment of a fifth; anthers 2-lobed, lobes divaricate at base, connected at apex by intervening filament, one of the lobes being sometimes reduced to a small lateral dehiscent gland: style winged at its apex or expanded into a remarkable tongue-shaped process, which is stigmatose at its emargination: fruit capsular, 2-locular, 2-valved: embryo slightly curved, much more so in *Salpiglossis*.

Salpiglossis, *Pteroglossis*, *Leptoglossis*, *Browallia*.

Tribe 6. *Petunieæ*. Corolla with an elongated tube, sometimes hypocrateriform, seldom with the rudiment of a palate, the border being divided into 5 nearly equal, rounded and emarginated lobes, their æstivation in *Petunia* being replicative (see p. 173), in *Nierembergia*, replicative at the base of the lobes, with a perfectly quincuncial imbrication at their summits: stamens 5, one of which is shorter, 2 longest; anthers 2-lobed, divaricate at base, without connective: stigma expanded into a remarkably tongue-shaped form, emarginate at its apex, in *Nierembergia* embracing the anthers: capsule and seed as in *Salpiglossideæ*.

Petunia, *Nierembergia*.

Tribe 7. *Hyoscyameæ*. Corolla tubular, more or less expanded in the mouth in a campanular form, with the border divided into 5 equal rounded lobes: stamens 5, equal; anthers 2-lobed, affixed to a narrow dorsal connective above, free below, and bursting longitudinally in front near the margin: ovarium 2-celled, and singularly surmounted by a fleshy epigynous gland, which is either small and stylobasic, or else enveloping the upper moiety of the ovarium: fruit an exsuccous berry, which sometimes bursts by a circumscissile line on the margin of the gland: embryo terete, annular, and somewhat spiral.

Hyoscyamus, *Scopolia* (?), *Physochlæna* (?), *Cacabus*, *Thinogeton*.

Tribe 8. *Atropeæ*. Corolla tubular, more or less campanular, with a border divided into 5 equal rounded lobes, which are imbricate in æstivation: stamens 5, equal; anthers ovate, 2-lobed, lobes laterally adnate, reversed in *Atropa* by the deflexion of the filaments: fruit baccate, 2- or 5-celled, fleshy, often somewhat exsuccous: embryo terete, nearly perispherical.

Atropa, *Nicandra*, *Cliocarpus*, *Anisodus*, *Mandragora*, *Lycium*.

Tribe 9. *Solandreæ*. Corolla generally with an elongated, straight, rarely a short tube, in no degree plicated in bud, border 5-cleft into more or less rounded equal lobes: 5 equal stamens, generally epipetalous, but sometimes arising from the outside of a free ring, attached to the base of the corolla; anthers oblong, 2-celled, cells parallel and adnate upon a dorsal connective, and bursting longitudinally in front: fruit a fleshy 2-locular berry, and seeds with a nearly straight terete embryo, with a lax testa, as in the *Cestrineæ*.

Solandra, *Marckea*, *Juanulloa*, *Sarcophysa*, *Ectozoma*.

Tribe 10. *Brunsfelsieæ*. Corolla with a more or less elongated tube, somewhat ventricose below the contracted mouth, border divided into 5 nearly equal segments, their æstivation being decidedly imbricative (unknown in *Heteranthia*): stamens didynamous, somewhat inflected at the apex, with one pair shorter; anthers unilocular and hippocrepiform, as in the *Verbasceæ* and the *Duboisieæ*: style slender: stigma small, bilobed, and simply clavate, or with the lobes somewhat gaping: fruit either capsular or baccate, with a nearly straight embryo.

Brunsfelsia, *Franciscea*, *Heteranthia*.

The *Solanaceæ*, *Atropaceæ* and *Scrophulariaceæ*, as here defined, evidently constitute an alliance, bound together by very striking and peculiar characters, distinguishable in the structure of their corolla and ovarium, but more especially in that of their

fruit, which is most generally 2-celled, with many seeds fixed to thickened placentæ adnate to the dissepiment, and having a terete embryo, more or less curved, with an inferior radicle, characters that are common to the whole of this large group. So gradual is the transition from one link to another of this chain, that it is difficult to discover any decided break in their continuity, but notwithstanding this, they form too large an assemblage to constitute one single family. The *Solanaceæ*, as distinguished from the *Scrophulariaceæ* in general, exhibit characters sufficiently marked, but the difficulty lies with the large intermediate group above indicated, that equally partake of the features of both these extremes. I am quite averse to the practice of multiplying unnecessarily the amount of natural orders beyond the smallest possible number: it is not therefore any idle notion of proposing a new family that leads now to this suggestion, which would defeat its own object unless supported by facts, and urged by the necessity of the case; but it is the desire of grappling with a formidable obstacle, that would otherwise prevent us from establishing any decided limits between these two great families. If this difficulty presented itself to me in so prominent a degree three years ago (Lond. Journ. Bot. v. 183, *note*), when I first noticed the anomaly in *Lycium*, and suggested its separation from *Solanaceæ* on that account, with how much more force must this discrepancy present itself, when the exceptionable cases now amount to so extensive an accumulation in point of number! The æstivation of the corolla has hitherto been considered to form an unerring line of demarcation between the *Solanaceæ* and *Scrophulariaceæ*, but if we place in the former family a large proportion of genera possessing an imbricate æstivation, and offering frequently nearly anisomerous flowers (characters peculiar to the last-mentioned order), we lose at once the only valid features that can serve to discriminate the boundaries of these great families. It is clear that the intermediate group here proposed to be collected together can only be disposed of in three modes: they must be associated either with the *Solanaceæ*, or be attached to the *Scrophulariaceæ*, or else they must remain as a distinct family. In the first case, the *Solanaceæ* would be then divided into two suborders: 1. the *Solanineæ*, having a corolla with valvate æstivation; and 2. *Atropineæ*, with imbricate æstivation. In the second case we should associate, 1. *Atropineæ*, with flowers nearly isomerous; and 2. *Scrophularineæ*, with anisomerous flowers. In either of these two cases we find that inconsistency to a great extent would be unavoidable; for in the former instance we admit a large circle of exceptions to the only leading characteristic mark of the order; and in the second case we include a considerable number of genera, nearly isomerous, in a

family whose principal feature is to possess anisomerous flowers; but in the third case we avoid these difficulties and ensure consistency, preserving at the same time the peculiar characteristic features both of the *Solanaceæ* and *Scrophulariaceæ*: we should then have thus, 1. *Solanaceæ*, offering isomerous flowers with a valvate or induplicato-valvate æstivation; 2. *Atropaceæ*, isomerous flowers, or nearly so, with imbricate or a peculiar æstivation; and 3. *Scrophulariaceæ*, anisomerous flowers with imbricate æstivation. In any of the three modes of distribution above indicated, it matters little which we adopt, in regard to the absolute arrangement of the various genera, for in every case they remain alike, in exactly the same linear order of position. The value of the *Atropaceæ*, as a distinct order, must now rest entirely on its own intrinsic merits: its adoption seems the only course by which a large amount of inconsistency can be removed, and it appears to me a far less objectionable plan to call up a new family, than to destroy the great landmarks that serve to discriminate the limits of two of the most natural families in the system.

Having shown the arrangement proposed for the distribution of the *Atropaceæ*, I must offer the following explanation. The division into the suborders *Rectembryeæ* and *Curvembryeæ*, as proposed by Endlicher, and followed by me in the arrangement of the *Solanaceæ* formerly given in 'Lond. Journ. Bot.' v. 148, offers by far too inconstant and doubtful a character to be maintained there, or be adopted here; for among the *Salpiglossideæ*, some species of *Petunia* possess an embryo nearly straight, and more curved in others, while in *Salpiglossis* it is often spirally bent into more than a complete gyration. I have preferred rather to follow the æstivation of the corolla, as it gradually verges from the plicato-valvate of the *Solanaceæ* into the imbricate mode of the *Scrophulariaceæ*: thus in the tribes *Nicotianeæ* and *Datureæ* we have the contorto-conduplicate, a form by no means valvate, but the first departure from it: in the *Duboisieæ* we have another advance, where the lobes of the border are seemingly valvate, but on examination their margins will be found convolutely inflected, a form which I have named volutive: in the *Salpiglossideæ* it assumes the next step here denominated reciprocative: in the *Petunieæ* we have again another degree, which is only a modification of the imbricative, and which I have termed replicative: and finally, in the *Hyoscyameæ*, *Atropeæ*, *Solandreæ* and *Brunsfelsieæ*, it becomes decidedly imbricative and quincuncial, as in the *Scrophulariaceæ*, with which natural order the latter tribe most closely osculates. In the *Atropeæ* the amount of imbrication is small in extent; in the genera *Brunsfelsia* and *Solandra* it is excessive in amount, the lobes wholly enveloping one another in

succession. I proceed now to add a few remarks upon each tribe separately.

1. *Nicotianeæ*.—The æstivation of the corolla in this tribe, as has been just remarked, is by no means valvate, or induplicato-valvate, as in the *Solanaceæ*, the lobes of its border being on the contrary conduplicate, that is to say, the sides are turned inwards, and each lobe is thus folded separately on its inner face, along the central nervure, the sides closely pressed together, the margins being quite free from those of the adjoining lobes, and thus plicated, they all possess a spirally twisted inclination in the bud. This approaches the æstivation of the *Salpiglossideæ*, to which tribe they offer a still nearer affinity in having the fifth stamen very often shorter, with the other four somewhat didynamous. It is for these reasons that I have removed the *Nicotianeæ* from the *Solanaceæ*, where I formerly placed them.

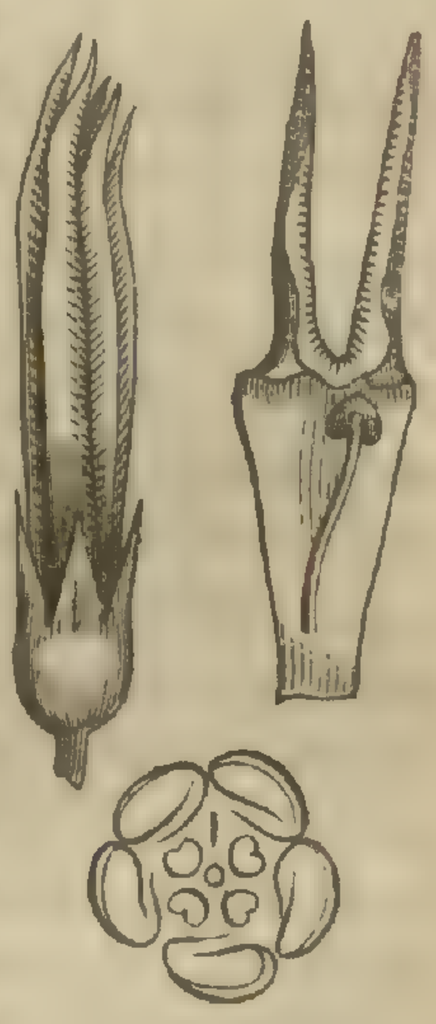
2. *Datureæ*.—With this very natural group *Solandra* has been associated by most botanists, but it evidently possesses a very different relationship. The *Datureæ* are remarkable for their large showy flowers, and they all present an æstivation similar to that of the *Nicotianeæ*, only more decidedly contortive and quite distinct from the valvate præfloration of the *Solanaceæ*. *Brugmansia* I consider as most decidedly distinct generically from *Datura*, with which it is associated by most botanists, differing in many points of structure, and forming arborescent shrubs, sometimes even tall trees, with long pendent trumpet-shaped flowers of an unusually large size.

3. *Duboisieæ*.—The genera composing this very distinct group were partly included by Mr. Bentham (Prodr. DeCand. x. 191) in his *Salpiglossideæ*; these are *Duboisia* and *Anthocercis*, to which Prof. Endlicher added *Anthotroche*, a genus which by the former has been referred to *Solanaceæ*. In proposing to alter the decisions of so distinguished a botanist as Mr. Bentham, who, from the accuracy of his observations and the solidity of his conclusions, stands deservedly as one of the first botanists of our time, it becomes necessary that I should offer some extremely valid reasons for the changes now suggested, and accordingly I will offer a few remarks on each genus in succession.

a. *Duboisia* appears to me to have no relation with any genus belonging to the *Scrophulariaceæ*. Its only species was originally described by Mr. Brown in his 'Prodr.' p. 448, who placed it, together with *Anthocercis*, in a second section of *Solaneæ*. The habit of this plant, as well as the structure of its flowers, are there stated to agree with those of *Myoporum*, whence it derived its specific name: the figure given of this plant by Endlicher in his 'Iconographia,' pl. 77, sufficiently agrees with other Myoporaceous plants there designed. On examining a specimen of

the same plant in Sir Wm. Hooker's herbarium, I noticed one very important character that has been quite overlooked by all preceding observers: the anthers are here decidedly extrorse, instead of the usual introrse direction before assigned to them. This circumstance brings *Duboisia* in close connexion with the two following genera, and at once removes them from the tribe of the *Salpiglossideæ*.

β. Anthocercis.—I was glad to avail myself of the opportunity of investigating the structure of the flowers in this genus from a plant in the living state of *A. viscosa*. It agrees with the figure given by Endlicher in his 'Iconographia,' tab. 68, of *A. littorea*, with the exception of the very important feature of the structure of the anthers, which, as in the preceding genus, offer the very distinct peculiarity of being affixed extrorsely just above the sinus upon the filament, so that the lines of dehiscence are towards the tube of the corolla, not introrsely towards the centre of the flower, as appears represented in the plate above referred to. The æstivation of the corolla in *Anthocercis viscosa* is also very peculiar: at first sight it would be said to be induplicato-valvate, but upon more careful examination it will be observed that each lobe of the border is distinctly supervolute, one of its edges being rolled inwards and overlapped by its opposite edge; these are not all turned in one direction, two being dextrorsely, and the other three coiled up alternately in a sinistrorse order. This mode of æstivation is certainly extremely unusual and peculiar, approaching that observed in the *Goodenoviaceæ*, on which on a former occasion (Lond. Journ. Bot. vii. p. 59) I have made some observations. There exists between them this difference, that here each lobe is longitudinally and supervolutely coiled round upon itself, in a somewhat spiral form, while in *Goodenia* the winged margins are respectively folded back over one another, upon the plane of the central portion of each segment. I have also examined in the dried state the flowers of *A. littorea*, *A. albicans*, *A. Tasmanica* and *A. scabrella*, and they all appear to offer the same kind of æstivation and similarly extrorse anthers, so that these appear to be constant characters. It is worthy of remark, that the peculiar smell of the leaves and flowers of *Anthocercis viscosa* resembles that of the *Myoporaceæ*, and that its pedicels are bibracteated, which is also a feature in that family; but its extra-axillary peduncles, the æstivation of its corolla, the position of its stamens, its bilocular ovarium with numerous ovules attached to a thick-



ened placentiferous dissepiment, its many-seeded capsular fruit, and its slightly curved embryo with an inferior radicle, are characters quite opposed to its admission into that family. Nor can these be made to harmonize either with the *Scrophulariaceæ* or *Solanaceæ*, to the latter of which they offer a nearer affinity. These characters are sufficiently prominent and distinct, and demand a more attentive investigation.

γ. *Anthotroche.*—This genus was placed by Prof. Endlicher in *Scrophulariaceæ*, among the *Salpiglossideæ*, but it has been since excluded from the order by Mr. Bentham, and referred to *Solanaceæ* (DeCand. Prodr. x. p. 586). It appears to me however to have as little relation with the one as with the other of these families. Upon examining a specimen belonging to this genus from Swan River, I find that in the structure of its anthers it agrees entirely with that just described as existing in *Duboisia*; this consists of one reniform unilocular cell, fixed extrorsely on the filament, and dehiscing on the exterior face by one hippocrepical suture. Here the tube of the corolla is short and straight, and the border is divided into five regular lobes, which are rotately expanded; the stamens are 5 and equal. The ovarium has an epigynous prominent stylobasic gland as in *Cacabus*, analogous to that of *Hyoscyamus*.

Respecting the *Duboisieæ* it only remains to be observed, that the main points of distinction between it and the other tribes with which it is here associated, will be found to exist in the extrorse direction of the anthers and the singular æstivation of the corolla, peculiarities which, although very remarkable, are not of themselves of sufficient importance to claim for the plants that compose it the rank of a separate family, but they constitute a very distinct tribe of the *Atropaceæ*. It will consist of two sections: 1. *Euduboisieæ*, with baccate fruit, and 2. *Anthotrocheæ*, with capsular fruit, comprising *Anthocercis* and *Anthotroche*. It corresponds with the other tribes of the *Atropaceæ* in the origin of the floral peduncles being lateral with respect to the point of insertion of the petiole.

4. *Schizantheæ.*—The genus *Schizanthus*, from the lateral extra-axillary insertion of its pedicels and other characters, appears evidently to belong to the *Atropaceæ* rather than to the *Scrophulariaceæ*, but it does not accord with any of the tribes above noticed. It differs from them in the structure of its anthers, which consist of two parallel cells, quite distinct and separated from one another, but conjoined by a broad membranaceous connective, upon which they are dorsally attached: it possesses five stamens, of which three are quite anantherous and rudimental; the corolla is deeply cleft into numerous unequal segments which have an imbricate æstivation. Its stigma approaches the form

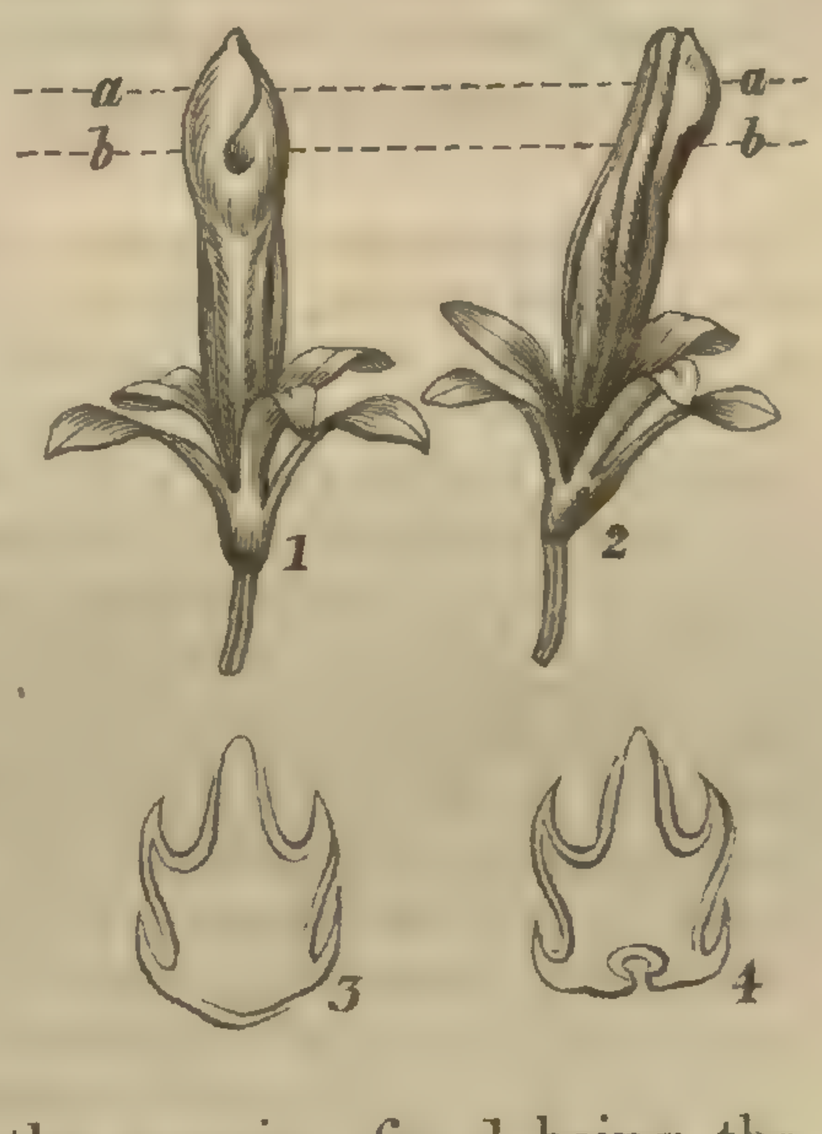
of that of *Heteranthia*: its fruit is capsular as in the *Salpiglossideæ*, and its seeds contain a terete embryo, curved in an almost spiral form. Its leaves are always alternate and deeply pinnatisected, showing an approach to *Salpiglossis* and *Pteroglossis*. The abortion of three of its stamens is an irregularity of which we find a parallel case in *Ianthe*, which only differs in that respect from *Verbascum*; and the deeply laciniated divisions of its corolla is another abnormal feature, but this may be considered only as a separation of the lobes of the corolla at each sinus, or a return to its five normal divisions, with a still farther cleavage of each lobe, by an extension in an excessive degree of the incisions commenced in the emarginatures of all the lobes of the border in *Salpiglossis*, which thus shows a tendency towards the laciniated form of the corolla of *Schizanthus*.

5. *Salpiglossideæ*.—I have ventured to remove this tribe wholly from the *Scrophulariaceæ* for the reasons that will be here fully explained, and as these are founded upon facts in great measure new, I may confidently expect that such an arrangement will meet with the concurrence of the author of the able monograph of this last-mentioned family, who in detailing the characters of the tribe in question, as given in the Prodr. DeCand. x. p. 190, goes the length of saying, "subordo Solanaceis capsularibus arcte affinis, et forte melius eis adsociandus." I propose however to remove from it several of the genera there associated. They form an extremely natural group, distinguished by the very peculiar æstivation of their corolla, their didynamous stamens, or where a fifth occurs it is invariably sterile, and they are especially conspicuous for the remarkable dilatation of the stigma, which at once signalizes them from the others. Their place is manifestly among the *Atropaceæ*, with which they agree in having the origin of the pedicels always somewhat lateral in regard to the floral leaflet or bract, not decidedly axillary, as in the *Scrophulariaceæ*. They are all herbaceous plants, generally clothed with viscid glandular pubescence, and the campanular portion of the tube of the corolla is plicated in æstivation; but the lobes of its border are first conduplicate, with the margins always free from those of the contiguous lobes, and twisted inwards in a peculiar manner, for which I have proposed the term reciprocative*, a condition intermediate between the induplicato-valvate æstivation of the *Solanaceæ* and the imbricate præfloration of the *Scrophulariaceæ*; in order to render this more evident, the accompanying

* It may be thus defined: Æstivatio reciprocativa, *i. e.* lobi superioris exterioris marginibus utrinque induplicatis, loborum alterorum simpliciter conduplicatis, 2 sinistralibus dextrorsim, 2 dextralibus sinistrorsim torsive convolutis, marginibus sese applicitis et a contiguis liberis postice spectantibus, plicaturis antice inclinantibus.

figure is given in the margin; fig. 1 being the corolla viewed sideways; fig. 2, ditto seen in front; fig. 3, ditto seen from above. I have added to this group a new genus, *Pteroglossis*, founded upon a plant collected in the north of Chile by Bridges (his No. 1389). In *Salpiglossis* the two broadly expanded lips of the stigma appear almost confluent into a tongue-shaped process, while in the other genera they are more or less distinctly separated and 2-lipped, especially in *Leptoglossis* and *Browallia*; but in *Pteroglossis* one of the lips appears altogether wanting, or reduced to a small prominent gland.

6. *Petunieæ*.—The genera which I have separated from the *Solanaceæ* to form this tribe, approach the *Salpiglossideæ* most closely in habit and in the general structure of their flowers and seeds, and moreover partake of their peculiar feature, the great dilatation of their stigma: the broadly expanded lips of this organ appear however more or less soldered into a tongue-shaped process, as in *Salpiglossis*, which singularly embraces the connate anthers in *Nierembergia**. They differ notwithstanding from the *Salpiglossideæ* in the peculiar complex æstivation of their corolla: that of *Nierembergia*, being figured in plate 18 A. fig. 2 of the 'Illustration of South Amer. Plants,' will require no further explanation: the figure of that of *Petunia* was omitted in plate 23 of that work, and its description was most obscurely given in 'Lond. Journ. Bot.' v. p. 18 (in a note), owing to several omissions and transposals of words in the hurry of the last moment of the monthly publication of that journal. In order to remedy this omission, a delineation of the æstivation† of *Petunia violacea* is now given in the margin; fig. 1 being the corolla seen in front; fig. 2, the same viewed sideways; fig. 3, a transverse section made across the line *a a*; fig. 4, ditto ditto across *b b*.



* See Ill. South Amer. Plants, pl. 18. A. fig. 4, B. fig. 5, and pl. 20. fig. 3.

† It may be thus more simply defined: Æstivatio replicativa, *i. e.* lobis omnibus subconduplicatis, superioris interioris marginibus revolutis, alterorum plicaturis postice torsis, marginibus cum contiguis quincuncialiter late imbricatis, margine altero hinc revoluto.

7. *Hyoscyameæ*.—This forms a very natural tribe, remarkable for the very singular epigynous gland, hitherto I believe new in the history of vegetable physiology, the origin and nature of which it is desirable to ascertain. It cannot bear any analogy with the true disc, which is always hypogynous in the superior ovarium and epigynous in the inferior germen, and which is generally admitted by botanists to be little more than a confluent whorl of abortive stamens. In *Cacabus* it assumes the form of an enlargement of the base of the style, but that it exists here as a distinct organ is proved by the swelling seen within the matured fruit, in the summit of the cavity of the cells. In *Thinogeton* it is considerably larger, where it appears as a coriaceous thickening of the chartaceous covering that forms the upper portion of its dry berry. It is however most distinctly developed in *Hyoscyamus*, even in the young ovarium, in the form of a fleshy external gland, which covers more than the superior moiety of the entire germen, and on making a longitudinal section it is seen distinctly adnate upon the true endocarpium: it forms therefore a very good discriminating character of this tribe. The cause of the opercular dehiscence of the fruit in *Hyoscyamus* is thus readily accounted for, because while the lower half of the pericarpial covering remains thin and membranaceous, the opercular portion becomes hard and coriaceous, from the indurescence of the glandular covering above-mentioned *. I have placed doubtfully in

* Although in the above case it is easy to trace the cause of the opercular dehiscence of the fruit, the same is not so readily accounted for in other cases; in *Anagallis* for example. In this last-mentioned instance, a distinct zonal line may be seen in the thin pericarpial covering before the ripening of the fruit, and it is along this that the membranaceous capsule afterwards bursts, by a clean circumscissure. This zonal line however bears no relation to the longitudinal true nervures, which may be distinctly traced in the pericarpial covering, and which, extending from the style to the base, may be referred to the midribs and marginal junctions of the original carpellary leaves: but what is the nature of the line which traverses these nervures at right angles across all the carpellary leaves? This is difficult to be accounted for, unless we imagine it to arise from a cause somewhat analogous to the case of *Hyoscyamus*, only that instead of the line being the marginal limit of an epigynous gland, it may be the edge of an original elementary hypogynous disc, which by its subsequent growth and attenuation becomes hardly distinguishable from the rest of the pericarpium. On examining this pericarpial covering, about the period of the fall of the corolla, this zonal line is seen more transparent than the rest of its substance, and not opake, as is observable in the regular longitudinal nervures which may then be readily traced; at this period however, and even in the younger state of the ovarium, before this zonal line becomes distinguishable, the lower half of the pericarpial membrane is decidedly of a more greenish hue than the upper moiety. This appears to me the only theory on which we can account for the dehiscence of the capsule in *Anagallis*, but in suggesting it, I confess that I could not discern the fact of the original existence and ultimate attenuation of such a disc as I have imagined. Although, generally speaking,

this tribe, *Scopolia*, *Physochlæna*, *Thinogeton* and *Cacabus*, genera which offer a striking affinity to one another in their most essential characters, and there can be little doubt that they all form a portion of one very distinct group. These characters coincide for the most part with those of *Hyoscyamus*, and the only consideration wanting to complete their affinity is the æstivation of their corolla. The funnel-shaped and almost entire border of the corolla in those genera would almost necessarily imply the regular plicature of its campanular portion, but it is probable that at the same time the lobes in æstivation may be somewhat imbricate, as is distinctly observable in *Nierembergia* and *Petunia*. It is impossible to determine this question from dried specimens, and it can only be ascertained from the examination of living plants. Should the æstivation be found, on the contrary, to be entirely induplicato-valvate, these four genera would not belong to *Atropaceæ*, but must be referred to *Solanaceæ*, where they would naturally find their place as a capsular tribe preceding the *Jaboroseæ*.

8. *Atropeæ*.—This very distinct group is distinguishable from the other tribes by its baccate fruit, and its ovary devoid of a fleshy epigynous gland. The first four genera possess a perennial root, with numerous deciduous herbaceous stems, large showy flowers, and a somewhat shrubby habit, with dense foliage and large leaves. *Lycium*, on the contrary, is a straggling shrub with woody stems, and frequently with spinous branches: its flowers are small. These differences are only generic, and do not offer sufficient reasons for separating the latter genus as a tribe distinct from the others.

no apparent hypogynous disc is to be seen among the *Primulaceæ*, it is occasionally discernible, but I believe only in those genera where the capsule bursts into valves by the longitudinal carpellary nervures, as in *Lysimachia*, of which genus Nees v. Esenb. in his 'Gen. Pl. Fl. Germ.' says distinctly, "Germen liberum basi disco annuliformi cinctum." This view of the case, though quite hypothetical, is rendered still more probable by the facts observable in the capsule of *Plantago* which offers a membranaceous pyxidium very similar to that of *Anagallis*. At an early period the future transverse line of dehiscence is discernible in the ovarium, as in *Anagallis*, but it is then more approximate to the base, proving that the growth of its lower portion is afterwards more considerable than the upper part; as it advances towards maturity the zonal line becomes more marked, the upper portion of the pericarpial covering being of a deeper green hue and more opake, while the lower moiety is distinctly hyaline and transparent, and of more slender texture; on becoming ripe, the greater indurescence of the upper half, by desiccation, is still more evident, facts which lead to the only reasonable conclusion, that the upper portion of the ovarium is covered by a very thin epigynous glandular covering, as in *Hyoscyamus*, but too thin to be readily detected in parts of such very slender texture: that it does exist, is however proved by the circumstance of that part of the pericarpial covering being always less pervious to light, when viewed under the microscope, than the lower moiety.

9. *Solandreæ*.—These form a very natural group, being all suffruticose, mostly subscandent plants, with large leaves and generally showy flowers. I have been enabled to obtain very satisfactory elements of the little-known genera *Juanulloa* and *Marckea*, besides those of two new genera. They bear a somewhat similar position among the *Atropaceæ* that the *Metternichieæ* hold among the *Solanaceæ*, and the analogy in the structure of the seeds of *Marckea* and *Metternichia* is sufficiently remarkable.

10. *Brunsfelsieæ*.—This group, consisting of some of the plants placed by Mr. Bentham in his *Salpiglossideæ*, is distinguishable from that tribe as above limited by the absence of the remarkable dilatation of the stigma: it will comprise the genera *Brunsfelsia*, *Franciscea* and *Heteranthia*: the latter much resembles *Browallia* in its habit, but it accords with the two former genera in the structure of its anthers, which are unilocular, and curved in the shape of a horseshoe round a fleshy globular connective, that in great part enters into and nearly fills the cavity of the cell, as in the *Verbasceæ*. I have here considered *Franciscea* as distinct from *Brunsfelsia*, which Mr. Bentham (in DeCand. Prodr. x. p. 198) combined together under one genus. In *Brunsfelsia* however the corolla is always of a yellowish colour, the tube is considerably longer and narrower in proportion, and the fruit consists of a large fleshy drupe inclosing a putamen which is quite indehiscent. In *Franciscea* the flowers are always of a purplish or violet colour, with a much shorter tube and an oblique rotate border: the fruit is generally capsular, and rarely somewhat baccate; but when this occurs, I have noticed in the dried specimens, that as the fleshy sarcocarp covering the putamen dries into the form of a coriaceous integument, both split into four divisions at the apex, in a valvular form, as in the capsular species. In *Brunsfelsia* the style is very long and slender, quite erect at the apex, and terminated by a small clavate stigma which is bilobed, its equal concave lobes being filled with a ball of grumous matter. In *Franciscea* the style is considerably enlarged and incurved at its summit, which is terminated by a much larger bilobed gaping stigma, the lower lobe being somewhat smaller, and it exhibits in its sinus a globe of viscous matter, seen only in the living state. In *Heteranthia* the style is far exserted, and is terminated at its slender and somewhat incurved apex by an almost obsolete fistulose stigma. The species of *Brunsfelsia* attain the size of large trees, 20 feet in height, while on the contrary those of *Franciscea* do not exceed the size of bushes, which are seldom more than 3 or 4 feet high. *Heteranthia*, on the other hand, is a small repent perennial plant, with short ascending branches, terminated by a racemose inflorescence.

Having now reviewed in succession the different genera composing the *Salpiglossideæ* of Bentham, with the exception of *Schwenkia*, it is necessary to offer a few words upon that genus, the true affinity of which for many years puzzled the sagacity of botanists.

Linnæus had the penetration first to point out its affinity with the *Solaneæ*, an opinion which has been since quite disregarded. It was afterwards considered as belonging to *Primulaceæ*, on account of the insertion of its stamens opposite to the lobes of the corolla. By Nees v. Esenbeck and Martius it was subsequently referred to *Scrophulariaceæ* (Nov. Act. xi. p. 47); but a note was added by Martius pointing out the greater probability of its affinity to *Acanthaceæ*, because of the fissure of the apex of the dissepiment, a character which I have not observed in the genus. This indication has not been adopted by others, certainly not by Nees, who in his monograph on this last-mentioned family (DeCand. Prodr. vol. xi.) does not allude in any way to *Schwenkia* in relation to it. Mr. Bentham was the first to explain the apparent anomaly of the position of the stamens in regard to the lobes of the corolla, and to demonstrate that the intermediate glands seen in most of the species constituted the true normal lobes of the border, and that the stamens were consequently alternate, and not opposite to its lobes. It was therefore placed by that able botanist next *Browallia*, a position that appears to me hardly satisfactory, on account of the valvate æstivation of the lobes of its corolla, and because its anthers consist of two distinct cells fixed on the apex of a dilated membranaceous filament. For these reasons, I would suggest its nearer affinity to *Fabiana*, with which it possesses many characters in common: the cristate projection of the placentæ from the middle of the dissepiment, and the insertion of the ovules in distinct linear series as described by Martius (*loc. cit.*), quite correspond with the figure I have given of the placentation of *Fabiana* (Ill. S. Am. Pl. tab. 17). *Schwenkia* however is a genus that requires more careful examination.

Having thus indicated those genera which I propose to separate from the *Solanaceæ*, it is desirable to exhibit the arrangement of the remainder that will hence constitute that family. There is a considerable alteration in the view now offered, from that given on a former occasion, as since that time most of the genera have been more attentively examined, and their characters more accurately ascertained. I intend therefore in the sequel to present a description of the outlines, all now completed, of such of the genera as have not yet been delineated, enumerating at the same time the several species composing them (with the exception of those of *Solanum*, *Capsicum*, *Physalis* and a few others),

to which will be subjoined a review of the several new genera that have presented themselves in the course of this inquiry. To these details will be added the description of such of the genera of the *Atropaceæ* as have not yet been described by me, and the whole will offer a large accumulation of novel facts, that probably may serve to facilitate the labours of the able botanist now engaged in a monograph of this large family, which has hitherto been so little studied.

In these investigations I have been carried far beyond the line originally intended, having been tempted to proceed by the abundant materials that have presented themselves to my notice, principally derived from the rich herbarium of Sir Wm. Hooker, to whose kind liberality I am mainly indebted for the opportunity of bringing to light so large an accumulation of new facts. The following synopsis will be sufficient to exhibit the proposed arrangement without farther explanations.

SOLANACEÆ.

Tribus 1. METTERNICHIEÆ (char. Lond. Journ. Bot. v. 148). Fructus capsularis, embryo teres, rectus	1. *Metternichia.* 2. *Sessea.*
Tribus 2. CESTRINEÆ (char. *loc. cit.*). *Id. id.*..	3. *Cestrum.*
Tribus 3. FABIANEÆ (char. *loc. cit.*). Fructus capsularis, embryo paullulo incurvatus, fere rectus.....	4 *Fabiana.* 5. *Vestia.* 6. *Schwenkia?*
TRIBUS 4. JABOROSEÆ. Corolla tubo elongato siccatione nigrescens: fructus baccatus 2-locularis, embryo teres, fere annularis	7. *Jaborosa.* 8. *Dorystigma.* 9. *Himeranthus.* 10. *Trechonætes.* 11. *Salpichroma.* 12. *Nectouxia.*
Tribus 5. IOCHROMEÆ. Corolla tubo elongato, limbo 5-fido plus duplo longiore: antheræ longitudinaliter dehiscentes: calyx fructiferus vix auctus baccam 2-locularem suffulciens vel arcte cingens: embryo teres, fere annularis	13. *Iochroma.* 14. *Cleochroma.* 15. *Lycioplesium.* 16. *Pœcilochroma.* 17. *Hebecladus.* 18. *Dunalia.* 19. *Acnistus.* 20. *Phrodus.*

Tribus 6. PHYSALEÆ. Corolla tubo brevi, limbo campanulato 5-angulato vel 5-partito: antheræ longitudinaliter dehiscentes: calyx fructiferus valde auctus et vesicarius: fructus baccatus, embryo teres, fere annularis..
21. *Physalis.*
22. *Larnax.*
23. *Margaranthus.*
24. *Withania.*
25. *Hypnoticum.*

Tribus 7. WITHERINGEÆ. Corolla tubo brevi, limbo 5-fido vix excedente: antheræ longitudinaliter dehiscentes: calyx fructiferus vix auctus, baccam 2-locularem suffulciens, vel eam arcte vestiens: embryo teres, spiraliter curvatus .....
26. *Witheringia.*
27. *Capsicum.*
28. *Brachistus.*
29. *Saracha.*
30. *Discopodium.*
31. *Puneera.*
32. *Aureliana.*
33. *Sichlera.*

Tribus 8. SOLANEÆ. Antheræ apice 2-porosæ, vel in tubum connatæ, intus dehiscentes: fructus baccatus, 2- raro pluri-locularis: embryo teres, spiraliter arcuatus .....
34. *Solanum.*
35. *Cyphomandra.*
36. *Triguera.*
37. *Lycopersicum.*

VERBASCEÆ.—The suggestions of our learned countryman offered in his 'Prodr. Fl. Nov. Holl.,' which I have cited in a former page (in a note, *ante*, p. 162), were evidently intended, in the state of our knowledge at that time, to apply principally to the *Verbasceæ*, which by Jussieu, Linnæus, and other eminent botanists had been classed among the *Solaneæ*. Bartling afterwards was the first to arrange the *Verbasceæ* as a distinct tribe among the *Scrophulariaceæ*, and Nees v. Esenbeck, acting upon the suggestion of Mr. Brown, proposed the *Verbascinæ* as a distinct family, intermediate between *Solaneæ* and *Scrophularinæ* (Trans. Linn. Soc. xvii. p. 78). The principal reasons that have induced all subsequent botanists to adopt the suggestion of Bartling, have been the imbricate æstivation of the corolla, and the frequent suppression of some of the stamens, which have been considered paramount to the many other not less important considerations that tended to show the near approximation of the *Verbasceæ* to the *Solaneæ*; but these objections, fatal as they were to the admission of this tribe into the latter family, do not apply to their connexion with the *Atropaceæ*,

with which group they exhibit beyond all doubt a very close alliance. This is manifest in their general habit, their alternate leaves with glutinous pubescence, their fetid smell, their powerfully narcotic and other medicinal qualities, which are so characteristic of the *Solanaceæ* and *Atropaceæ*: to these may be added the particular structure of their stamens, which have their anthers of a somewhat lunar form, and quite unilocular, curved round a large clavate termination of the filament, with an almost globular expansion of their connective, within the cell, that serves as the polliniferous receptacle, a character pointed out by Nees as being foreign to the *Solaneæ* and rare among the *Scrophularinæ*, and as claiming for them a distinct station in the system. On the other hand it should be borne in mind, that this peculiar character exists also in the genus *Scrophularia* itself, the flowers of which exhibit often declinate anthers and barbate filaments, together with a fifth sterile stamen, a feature rare in the *Scrophulariaceæ*, and one that tends to show a very close connexion of this genus with the *Verbasceæ*, with which tribe it had been before associated by all preceding botanists, until Mr. Bentham, in his admirable monograph of the order, has placed it among the *Cheloneæ* (DeCand. Prodr. x. 299). In most of the genera of this last-mentioned tribe, the anthers are formed constantly, I believe, of two distinct and divaricate cells, affixed at their apex on the slender summit of the filament, and quite wanting of the fleshy connective so manifest in *Scrophularia* and the *Verbasceæ*. Whatever may be determined in regard to the proper place of the *Verbasceæ* in the system, it is manifest that it is not by the number of the stamens that we can fix the limit between the *Atropaceæ* and *Scrophulariaceæ*: thus it is impossible to separate *Celsia* from *Verbascum*, and it would be equally as admissible to include *Celsia* with its didynamous stamens, or *Ianthe* with its single pair, in *Atropaceæ*, as it is to place *Verbascum*, with its regular pentandrous flowers, in *Scrophulariaceæ*: such discrepancies cannot fail to occur in many solitary points of osculation between the genera of different tribes, in all our artificial modes of the classification of plants. We have also other instances not less strikingly contrary to the ordinary rule in the *Xuaresia biflora* of the 'Flora Peruviana,' which has a regular 5-partite corolla and 5 alternate equal stamens: this plant Mr. Bentham unhesitatingly considers to be a true species of *Capraria*, a genus decidedly *Scrophulariaceous*; and in like manner the *Bacopa* of Aublet with its 5 equal stamens offers another exception, but here the plant has opposite leaves, and possesses so precisely the habit and general features of *Herpestes*, that its position must without doubt be fixed contiguous to that genus. The same rule will apply to another anomalous case instanced by Mr. Bentham

in the genus *Campylanthus*, the seeds of which have a perispherically-curved embryo, a character that by itself would place it in *Atropaceæ*; but that distinguished botanist fixes its position among *Scrophulariaceæ*, on account of the form of its corolla and of its anthers, notwithstanding, as he observes, that it bears little analogy with any other genus contiguous to it. The principal reason however that appears to me to give the *Verbasceæ* the preference of a place among the *Scrophulariaceæ* is the truly axillary origin of the floral peduncles, a character that in all such doubtful cases may be employed as a decisive line of demarcation between that order and the *Atropaceæ*. The position of the *Verbasceæ* should then appear at the head of the *Scrophulariaceæ*, occupying the place of a suborder in the manner of the *Salpiglossideæ* of Bentham (DeCand. Prodr. x. p. 190), where they would serve as a connecting link of the closest affinity between these two families.

Retzia.—This anomalous genus* has never yet found a certain or satisfactory place in the system, and its position must remain problematical until the structure of its fruit and seed be more accurately investigated. By many botanists it has been placed in *Convolvulaceæ*; others have indicated its relation to *Apocyneæ*; some have again referred it to *Polemoniaceæ*, with which it certainly offers no affinity; and Bartling proposed for it a new natural order, under the name of *Retziaceæ*, but this stands upon too insufficient grounds. Endlicher places *Retziaceæ* as a doubtful order after *Solanaceæ*, and Dr. Lindley arranges the genus *Retzia* among *Solanaceæ*, after *Sessea*. In the form of its calyx and of its corolla, the number and position of its stamens, its bilocular ovarium with placentæ attached to the dissepiment, the structure of its capsule and of its seeds as far as they are known, offer characters strictly conformable with those of *Solanaceæ*; but it would now rather fall among the *Atropaceæ*, on account of the æstivation of its corolla, which is said by Endlicher and Lindley to be imbricate, and not valvate: the form of its embryo, which on the authority of Brown (Prodr. 482) is terete and straight, necessarily, if it were admitted into this family, would point to its situation as a tribe near the *Solandreæ*.

Thus far every feature appears in conformity with such an ar-

* Retzia, *Thunb. Calyx* tubular, 5-fid, lobes lanceolate, somewhat unequal. *Corolla* tubular, elongated, straight, tube in no degree plicated, border of 5 short equal lobes imbricated in æstivation. *Stamens* 5, equal, nearly sessile in mouth of tube, alternate with its lobes, *filaments* extremely short. *Anthers* oblong, cordate, 2-celled, cells parallel, bursting longitudinally in front. *Ovarium* oblong, seated on a fleshy gland, 2-locular, ovules upon placentæ adnate to the dissepiment? *Style* longer than corolla, filiform. *Stigma* very short, bifid, with divaricate linear segments. *Capsule* bisulcate, bilocular, bivalved. *Seeds* several. *Embryo* straight, terete.

rangement, but one objection presents itself which renders this conclusion somewhat unsatisfactory, and that is the peculiar habit of the only well-recognized species, *Retzia spicata*, which is different from that of any *Solanaceous* or *Atropaceous* plant. Here the leaves are verticillate in fours, and the flowers are solitary and sessile in each axil, being supported by two bracts similar in size and shape to the lobes of the calyx. The genus *Solenostigma* of Klotzsch, founded upon one of Zeyher's African plants, and supposed to be identical with *Retzia*, was placed by that botanist in *Stilbaceæ*; but the name would imply that the stigma is there hollow and tubular, while in *Retzia* it consists of two small linear divaricate segments; hence it is probable that Klotzsch's plant is very different from that of Thunberg. I may here observe however, that this fact does not of itself invalidate their mutual affinity, for in the vast genus *Solanum* we meet with different species, some with a hollow tubular stigma, and others with bifid linear segments, exactly similar to the stigma of *Retzia*. The *Polemonium campanuloides* and *P. roelloides* of Thunberg have been referred to *Retzia* by Sprengel, G. Don and Dr. Walpers; these plants have both alternate leaves, and if really species of that genus, they would tend to remove the doubts above expressed in regard to the place of *Retzia* in this natural order. Willdenow states (Syst. i. 887) that the two species last alluded to, cannot belong to *Polemonium*, which has a trifid stigma; and he adds, that *P. campanuloides* has a bifid stigma as in *Retzia*. The *Convolvulus œnotheroides* (Linn. fil.) is also said to be another species of this genus. The only facts wanting to confirm its place in the system are the position of its ovules and the structure of its seeds. Dr. Lindley, who has examined its ovarium, has observed that its ovules are very few, two (or four?) in each cell, articulated with and suspended from the dissepiment by a large thickened funiculus, a character not at all conformable with the *Atropaceæ* or *Solanaceæ*, and one that would seem to remove this genus nearer to the *Bruniaceæ*, with which *Retzia* will be found to possess many similar characters. For the present therefore we must hesitate in attaching *Retzia* to the *Atropaceæ*.

The genus *Lonchostoma* of Wikström, placed by most botanists in *Retziaceæ*, offers, I find, many characters in common with *Bruniaceæ*: its sepals are united at the base by a membranaceous tube which closely invests the ovarium, if not almost adnate with it; they are surrounded by bracts of equal size: it resembles *Gravenhorstia* in having its petals combined into a funnel-shaped tube with a 5-partite border, the lobes of which are carinate and convolutely imbricate in æstivation; the anthers, cordate at base, are nearly sessile in the mouth; the style is divided halfway down and terminated by clavate stigmata; the ovarium, 2-celled, appears

under the microscope to be composed of two distinct, though connate carpels; the ovules are few, horizontally attached, or somewhat pendulous from narrow axile placentæ attached to the twofold dissepiment. These are characters that seem to correspond in great measure with the *Bruniaceæ*, with which the habit of *Lonchostoma* does not ill accord. These are merely hasty indications, as it would be foreign to the object of the present investigation to pursue such inquiries farther.

END OF THE FIRST VOLUME.

PLATE XXIX.

Exhibits a portion of a branch of *Lycioplesium fasciculatum*.

Fig. 1, is a flower complete. *Fig.* 2, is the calyx and peduncle. *Fig.* 3, the corolla cut open to show the insertion of the stamens; *all nat. size.* *Fig.* 4, stamens seen in different positions, before and after dehiscence. *Fig.* 5, the entire pistil with the calyx cut open and thrown back, to show the ovarium; *both magnified.*

PLATE XXX.

Shows *Iochroma longipes*.

Fig. 1, is the corolla. *Fig.* 2, ditto, cut open to show the stamens. *Fig.* 3, anther in different positions, before and after dehiscence. *Fig.* 4, calyx, style and stigma. *Fig.* 5, ditto, with the calyx thrown back, to show the ovarium with its basal gland: *all nat. size.* *Fig.* 6, stigma and a portion of the style; *magnified.* *Fig.* 7, the berry of *Iochroma tubulosa*, enclosed within the persistent calyx. *Fig.* 8, ditto, removed from the calyx. *Fig.* 9, transverse section of ditto. *Fig.* 10, a seed; *all nat. size.* *Fig.* 11, longitudinal section of a seed. *Fig.* 12, the embryo, removed from the albumen; *both magnified.*

PLATE XXXI.

Represents *Iochroma* (*Chœnesthes*) *lanceolata*.

Fig. 1, is the calyx and peduncle. *Fig.* 2, the corolla. *Fig.* 3, ditto, cut open to show the stamens. *Fig.* 4, a stamen; *all nat. size.* *Fig.* 5, an anther, before and after dehiscence. *Fig.* 6, the pistil. *Fig.* 7, the berry, enclosed in the persistent calyx, which splits on one side. *Fig.* 8, transverse section of the berry. *Fig.* 9, a seed; *all nat. size.* *Fig.* 10, ditto, *magnified.* *Fig.* 11, longitudinal section of nucleus of ditto. *Fig.* 12, embryo removed from the albumen; *both equally magnified.*

PLATE XXXII.

Shows a portion of a branch of *Cleochroma grandiflora.*

Fig. 1, the corolla cut open, to show the position of the stamens. *Fig.* 2, the stamens, seen in different positions, before and after dehiscence. *Fig.* 3, the calyx cut open, to display the ovarium surmounted by the style and stigma. *Fig.* 4, the berry enclosed within the enlarged calyx, which splits on one side. *Fig.* 5, transverse section of the berry; *all nat. size.* *Fig.* 6, longitudinal section of a seed; *much magnified.*

PLATE XXXIII.

Is a representation of *Hebecladus mollis.*

Fig. 1, is the calyx with its peduncle. *Fig.* 2, the corolla. *Fig.* 3, ditto cut open, showing the transparent areolœ at base, and the position of three of the stamens. *Fig.* 4, the stamens removed. *Fig.* 5, the pistillum. *Fig.* 6, a berry, supported by its persistent calyx. *Fig.* 7, transverse section of a berry. *Fig.* 8, a seed; *all nat. size.* *Fig.* 9, longitudinal section of a seed; *much magnified.*

PLATE XXXIV.

Show part of a branch of *Pœcilochroma Lobbiana.*

Fig. 1, is the corolla, cut open to show the position of the stamens. *Fig.* 2, the stamens. *Fig.* 3, the calyx, style and stigma; *all nat. size.*

J Miers Lithog

Printed by Huilmandel & Walton

Lycopodium fasciculatum

Details of I tubulosa

J Miers ad nat del

Iochroma longipes.

J. Miers lith.

Printed by Hullmandel & Walton.

Lychroma (Chrysothe.) lanceolata

J. Miera lithog.

Printed by Hullmandel & Walton

Cleochroma grandiflora.

J. Moore lithog.

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Hebecladus mollis.

J.Miers lithog.

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Pœcilochroma Lobbiana.

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